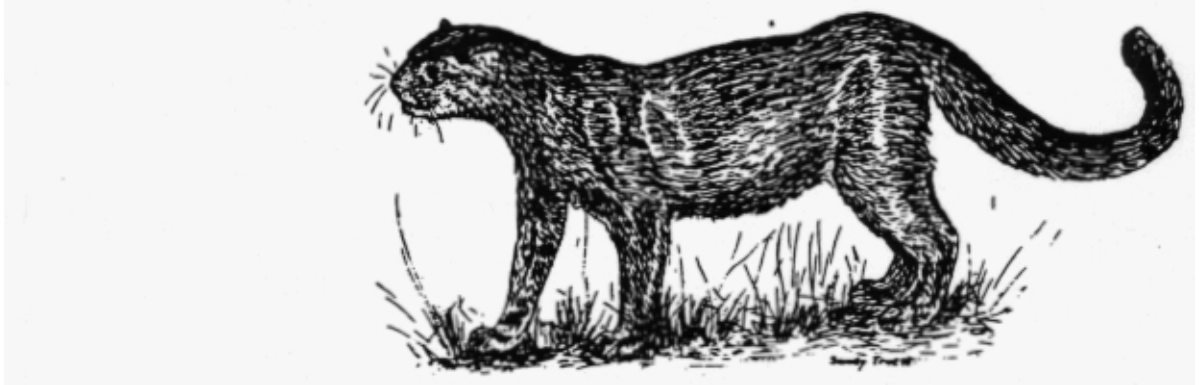


LISTED CATS OF TEXAS AND ARIZONA RECOVERY PLAN (With Emphasis On The Ocelot)



U.S. Fish and Wildlife Service
Albuquerque, New Mexico

1990

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LISTED CATS OF TEXAS AND ARIZONA

RECOVERY PLAN
(With Emphasis On The Ocelot)

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8/22/90

DISCLAIMER

This is the completed Listed Cats of Texas and Arizona Recovery Plan (With Emphasis on the Ocelot). It has been approved by the U.S. Fish and Wildlife Service. It does not necessarily represent official positions or approvals of cooperating agencies and does not necessarily represent the view of all individuals who played a role in preparing this plan. This plan is subject to modification as dictated by new findings, changes in species status, and completion of tasks described in the plan. Goals and objectives will be attained and funds expended contingent upon appropriations, priorities, and other constraints.

Literature Citations should read as follows:

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SUMMARY

- GOAL:** To remove the ocelot and jaguarundi from the Federal list of endangered and threatened species.
- RECOVERY CRITERIA:** Specific criteria for downlisting and delisting the listed cats are difficult to determine. The implementation of tasks specified in this recovery plan will aid in establishing these criteria.
- ACTIONS NEEDED:** The major steps needed to meet the recovery criteria include: determining the precise population sizes and habitat sizes required for viability and the necessary spatial arrangement of habitat, and determining the impact of disease and other factors on the population; increasing ocelot numbers in Texas, in part by protecting at least 20,000 hectares of prime ocelot habitat in Texas (either in a single block or continuous blocks connected by corridors); determining ocelot distribution and status in Arizona and the northern states of Mexico; and determining the status, ecology, and conservation needs of the jaguarundi in Texas, Arizona, and the northern states of Mexico.

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PART I

INTRODUCTION

Four Neotropical felid species have ranged into the United States in recorded history. The ocelot, Felis (Leopardus) pardalis; margay, Felis (Leopardus) wiedii; jaguarundi, Felis (Herpailurus) yagouaroundi; and jaguar, Felis (Panthera) onca have been documented as either transient or resident in Arizona and/or Texas. Of these, only the ocelot has been regularly documented recently in the United States.

Sightings of jaguarundi have been reported in numerous habitats and localities in Arizona and Texas, but recent, good documentation is limited. On April 21, 1986, a road-killed jaguarundi was recovered from Cameron County, Texas; however, this is the only confirmed specimen from Texas since 1969. No data exist on the status of the margay within the boundaries of the United States. Except for occasional wanderers from Mexico, the jaguar can now be considered extirpated from the United States. These latter three species are discussed in Appendix III. Should new information become available on the status of these three species in Arizona and Texas, the recovery plan will be revised to include appropriate recovery actions.

The ocelot is a medium-sized spotted cat (Figure 1) that ranges from southern Texas and Arizona to northern Argentina. Within this area, the ocelot can be found in humid tropical and subtropical forests, coastal

mangroves, swampy savannas, and semi-arid thornscrub (IUCN 1978, Leopold 1959). Population estimates throughout its range are largely unavailable. It is thought to be rare and threatened in many parts of its range, but not so in areas such as the Chaco region of Paraguay (IUCN 1978). Considered more adaptable than the jaguar, the ocelot may persist in partly-cleared forests, second growth woodland, and abandoned cultivation that has gone back to brush (IUCN 1978).

Ocelots are primarily crepuscular and nocturnal, spending the day in heavy brush (Tewes and Everett 1982, Grzimek 1975, Leopold 1959). Their prey consists of small to medium-sized mammals and birds, but may also include reptiles, fish and invertebrates (Nowak and Paradiso 1983, Grzimek 1975, Morris 1965, Leopold 1959). Tewes and Everett (1982) report males ranging wider than females, and one male's home range may overlap more than one female's home range. Adult males' home ranges are exclusive of other adult males and adult females often exclude other adult females (Tewes 1986).

In captivity, first estrus has been seen as early as 8 months old, but 2 years is the usual age of first conception (Seager and Demorest 1978). Estrus generally lasts 7-10 days, 5.3 days if conception occurs (Eaton 1977). Captive ocelots are polyestrous all year (ISIS 1985, Seager and Demorest 1978). This observation has also been confirmed at the Arizona-Sonora Desert Museum (ASDM). Hall and Kelson (1959) report births from September to January. Cahalane (1961) reports births in Texas in September and October. Tewes (1986), also in Texas, reports births in late summer,

late fall, early winter, and one in late spring. Laack and Rappole (1986) report the birth of twin ocelots in late November in south Texas. Gestation has been recorded as 80 and 89 days (Seager and Demorest 1978) and as 70 days (Nowak and Paradiso 1983). ASDM has reported a known gestation of 80 days.

Usually one or two kittens are born, but litter sizes ranging up to four have been reported (Nowak and Paradiso 1983, Seager and Demorest 1978, Eaton 1977, Morris 1965, Cahalane 1961, Hall and Kelson 1959). The age at weaning and length of dependence on the mother have not been recorded precisely. However, Tewes (1986) delimits lactation in one case to 92 days. Nursing has been observed at ASDM until 6 months old. Tewes and Everett (1982) report juvenile ocelots traveling with their mother even after lactation had ceased; and Tewes (1986) reports two subadult females up to 2 years old occupying home ranges that considerably overlapped their respective mother's home range.

RACES OF OCELOT AND HISTORIC RANGES IN THE UNITED STATES

Two ocelot subspecies historically ranged into the United States: the Texas ocelot, Felis pardalis albescens, and the Sonora ocelot, F. p. sonoriensis (Hall 1981, Figure 2). The Texas ocelot may have ranged through southern and eastern Texas, north to Hedley, Texas, and west to Marfa, Texas. The type specimen for the Texas ocelot is from an unspecified locality in southwestern Arkansas along the Red River (Sealand 1979). It is possible that the Texas ocelot also ranged into

western Louisiana but documentable records since the Pleistocene are lacking (Navarro Lopez 1985, Lowery 1974, Kurten 1965, Ray et al. 1963). In Mexico, the Texas ocelot was found from the foothills of the Sierra Madre Oriental in Coahuila, through Nuevo Leon and Tamaulipas to the Gulf Coast (Figure 2). The Texas ocelot is isolated from the Sonora ocelot by the Sierra Madre highlands.

The Sonora ocelot historically ranged into southeastern Arizona as far north as Fort Verde (Hall 1981, Cockrum 1960). Brown (1985a) questions the true origin of the Fort Verde specimen and suggests the specimen came from further south in Arizona. Hoffmeister (1986) also questions the origin of the Fort Verde specimen. He suspects that the specimen may have been obtained in Mexico or Texas. Brown (1985a) suggests that the Sonora ocelot, like the coati and the javelina, is a recent invader of southeastern Arizona from its range in Sonora. He lists six reports of ocelots in southeastern Arizona since 1963. In Mexico, the Sonora ocelot is found in the foothills of the Sierra Madre Occidental through Sonora and probably into northern Sinaloa (Hall 1981, Burt 1938). The Sonora ocelot is absent from the desert scrub of western Sonora.

The races of ocelot in North America were last revised by Goldman in 1943. He observed an intergrading chain of geographic races along western Middle America. In western Mexico the northern part of the species' range is inhabited by the smallest and palest race, *F. p. sonoriensis*. The southernmost part of the species' range in North America is inhabited by the largest and darkest North American race, *F. p. mearnsi*, in Panama. The

northernmost limit on the eastern side of the continent is inhabited by F. p. albescens. This race is as pale-colored as the Sonora ocelot, but is isolated from it by the Sierra Madre highlands. The Texas ocelot is larger than the Sonora ocelot, and has a distinctly longer and more angular skull.

LEGAL STATUS OF THE OCELOT

The Endangered Species Conservation Act of 1969 listed the ocelot as an endangered "foreign" species. Separate listing procedures for "native" species were required under the 1969 Act, but were not carried out for the ocelot. Hence, when the 1969 Act was replaced by the Endangered Species Act of 1973, the U.S. ocelot population was inadvertently omitted. Not until 1980 was a proposal submitted to correct this oversight. Finally in July, 1982, the U.S. ocelot population was included with all foreign populations as a federally endangered animal under the Endangered Species Act of 1973 (Federal Register, Volume 47, number 140, 1982).

In Texas, the ocelot is protected by state law and receives state endangered species status (Texas Parks and Wildlife Department 1987). The Texas Parks and Wildlife Department is the state agency responsible for protection of the Texas ocelot.

In Arizona, the ocelot has been protected by order of the Arizona Game and Fish Commission (AGFC) since 1970. Further, under Arizona Live Wildlife Regulation (R-12-4-319, 1980), all live wild felids are considered "prohibited wildlife." The ocelot is thus afforded some protection from

"live" taking; and possession, importation, exportation, and propagation are regulated, but only in a general sense. However, because no major threats to its habitat have been identified, the ocelot is not included in the Arizona List of Threatened Native Wildlife (AGFC 1982).

The IUCN Red Data Book (1978) lists the ocelot as "vulnerable." The IUCN (1972) also lists the Texas ocelot as an endangered subspecies. The Texas Organization for Endangered Species, TOES, (1979) lists the ocelot as endangered. Neither of these organizations have enforcement capability. The IUCN Red Data Book acts as an international source of advice on endangered species. The TOES advises on the state level.

The Convention on International Trade in Endangered Species (CITES 1983) lists two races in Appendix I: F. p. mearnsi, the Costa Rican ocelot, and F. p. mitis, the Brazilian ocelot. The U.S. and other signatory nations to CITES agree to certain regulations controlling international commerce of listed species and their parts. Appendix I listing requires export documentation from the country of origin and import documentation from the country of destination.

STATUS OF THE SONORA OCELOT IN ARIZONA

BACKGROUND: The paleontological evidence of ocelots in the United States is scant, with fossil records only from Florida, California, and Arizona (Navarro Lopez 1985). There are no recent reports of ocelots from Florida or California. The single Holocene specimen from Arizona is a skull

recovered from an archeological midden near Redington on the San Pedro River in southeastern Arizona (Burt 1961). There is no known Papago or other native Arizona Indian word for ocelot (Saxton and Enos 1983), and other archeological material is lacking.

DISTRIBUTION: Accounts of ocelots are absent from the reports of early Arizona explorers (Davis 1982). The only historic literature record is a skin sent to the U.S. National Museum by E.A. Mearns in 1887 (Hoffmeister 1986, Cockrum 1960). The skin, without the skull, supposedly originated at Fort Verde, Arizona, but this is questionable. Goldman (1943) did assign the specimen on the basis of pelt characteristics and location to the Sonora race, the type specimen of which was taken on the Rio Mayo near Camoa, Sonora (Figure 3).

The next ocelot was recorded in the state summary of the Predatory and Rodent Control Branch of the U.S. Biological Survey for fiscal year 1931-32 (Brown 1985b). Hoffmeister (1986) says this ocelot was taken near Camp Verde.

In 1963, John S. Phelps reported seeing an ocelot on the San Simon River, north of San Simon in Cochise County. (Mr. Phelps is now the predator and furbearer biologist with Arizona Game and Fish Department.) Two seasonal employees of the Bureau of Land Management also observed this ocelot (Figure 3).

In September 1964, a large ocelot was killed by Sewell Goodwin and Ted

Ferguson on Pat Scott Peak in the Huachuca Mountains, and this ocelot constitutes the first documentable specimen since the Redington specimen, as well as the last documented ocelot in Arizona (Figure 3).

Undocumentable reports of additional ocelots being taken after 1964 exist, but the protected status imposed in 1979 may have prevented them from being reported (Brown 1985b). Since 1980, at least four ocelots may have been inadvertently trapped in Arizona: two said to be from the San Pedro Valley (including a lactating female), a male reported taken in the Holbrook-Concho area, and an animal of unknown sex reported from the area of Sasabe (Brown 1985b).

Ocelots are known to occur in northern Sonora, though museum material is lacking. Brown (1985b) reports records of trapper and hunter takes of ocelots in 1966, 1970, and 1974 in northern Sonora.

At least two curio shops openly display and sell ocelot pelts in Nogales, Sonora, Mexico. The origin of these pelts is unknown. Prices range from \$75 to \$125.

The possibility that reported ocelots are escaped or released captives cannot be discounted. Another possibility is that individual animals have wandered into Arizona via corridors of tropic-subtropic vegetation in the Rio Yaqui and Rio San Miguel drainages described by Gentry (1982) and discussed by Lawler and Van Devender (1984) and Brown (1985b).

Brown,(1985a) also points out that the ocelot may be duplicating the northward expansion of the javelina, coatimundi, and other recent Neotropical invaders. Dense subtropical riparian forest occurs along the drainages in the Rio Yaqui, Rio Mayo, Sonora, and the San Pedro River Valley, Arizona. These dense forests are being rapidly cleared north and south of the border, particularly the extensive mesquite bosques along the San Pedro River.

CONCLUSIONS/RECOMMENDATIONS: Virtually nothing is known of the ocelot in Arizona, but recent reports of ocelots in southeastern Arizona warrant further investigation of its status in Arizona and northern Sonora. An informal survey of residents along the upper Rio Yaqui and Rio San Miguel may shed much light on the animal's distribution. More information from the field is necessary to assess the ocelot's status in these areas.

Immediately, plans should be designed and implemented to survey hunters and licensed trappers in Arizona using guidelines employed in Texas (Tewes and Everett 1982) and by the Arizona Game and Fish Department. Information could also be obtained on jaguarundis, which are frequently reported, but as yet undocumented, in Arizona.

The only information available to date has originated from lay persons and trappers. Professional biologists should be involved to assist in obtaining information on the status of these cats. Timely acquisition of basic information may be critical to the survival of the ocelot in Arizona.

STATUS OF THE TEXAS OCELOT

BACKGROUND: The Texas ocelot type specimen was taken in Arkansas in 1855. Bailey (1905) reported that ocelots were found in the Texas Hill Country as late as 1905, but records are scant (Navarro Lopez 1985). Distribution is now most likely limited to the Tamaulipan Biotic Province. It once occurred from Texas to Florida, with fossil evidence from Florida in the Illinoian period of the Pleistocene (Kurten 1965). Occasional hunter and trapper takes have been reported from deep south Texas for years, but it was not until 1980 that the first scientific surveys of ocelots and jaguarundis were undertaken. It became evident in following years that ocelots and probably jaguarundis were present in the brush country of south Texas, but documentation was lacking. Tewes and Everett (1986) conducted a trapper survey by mail of a 25-county area during 1982 (Figure 4). Of 1,572 trapper surveys mailed, 472 (30%) were returned, and 87 (6%) contained positive responses. Criteria for evaluation of credibility and approximate locations are in Figures 5, 6, and 7. Only a portion of the Edwards Plateau Region that once supported ocelots (Bailey 1905) was surveyed.

The Edwards Plateau, northwest of present ocelot range, remains to be surveyed thoroughly. Additionally, public interest was generated through numerous newspaper and magazine articles that resulted in unsolicited responses and leads on ocelot sightings (Tewes and Everett 1986).

In 1981, the United States Fish and Wildlife Service, Office of Endangered Species, contracted with the Caesar Kleberg Wildlife Research Institute, Texas A&I University, Kingsville, Texas, to begin field investigations on the ecology of the jaguarundi and ocelot in south Texas (contract #14-16-0002-81-229). Research has focused on investigation of basic biology, habitat inventory, status, and distribution. The majority of the field investigations has been centered at and coordinated with personnel of the Laguna Atascosa National Wildlife Refuge (NWR). Information obtained to date is summarized in the remainder of this discussion.

DISTRIBUTION: The complete distribution of the jaguarundi and ocelot remains unknown in Texas. The ocelots recorded so far by trapping (Figure 8) and photo-documentation have occurred at different sites in four counties: Cameron, Willacy, Kenedy, and Hidalgo. The Fish and Wildlife Service map of ocelot habitat in Texas (Figure 9) is modified from a report by Tewes and Laack (1989). Areas that are designated as occupied habitat represent "... the occurrence of ocelots that have either been radio-tracked or extremely good reports of sightings" (Tewes and Laack 1989), with an enlarged ten-mile radius to accomodate the known movement patterns of ocelots. Counties that contain areas identified as occupied habitat are: Cameron, Duval, Hidalgo, Jim Wells, Kenedy, Kleberg, Live Oak, Nueces, San Patricio, Starr, Willacy, and Zapata. These areas (except for human habitations) are considered to be occupied by ocelots at some time of the year.

The northern boundary of present ocelot range runs from the northern edge of Maverick County in west Texas to Calhoun County in east Texas. Any area south of that boundary line is considered potential habitat if it contains suitable brush (Figure 9). These areas have not been surveyed to determine ocelot presence.

The present distribution for ocelot and jaguarundi will probably not be completely known until thorough surveys are completed in Class I sighting areas, through trapping and remote sensor photo-documentation.

ECOLOGY/LIFE HISTORY: Ocelots have been trapped successfully using modified tomahawk live traps baited with live chickens and, in some cases, supplemented with feline lures (Figure 10). No jaguarundis have been captured or photographed. Ocelots have also been photo-documented using remote sensor cameras (Twedt and Rappole 1986) (Figure 11).

Over 20 ocelots have been radio-tagged and their movements and activities periodically followed until loss of transmission or death of the animal. The average composite home range for adult resident ocelots ($N = 8$) in south Texas was 15.18 km^2 ($SD = 6.47$). The average home range of adult male ocelots ($N = 5$) was 17.67 km^2 and of adult females ($N = 3$) was 11.04 km^2 (Tewes 1986). Male ocelots tend to travel more than females, the male generally covering an extensive area in a short time, with the female covering less area but using the home range more intensively (Tewes and Everett 1982). Ocelots home range was also significantly larger during winter than summer on the Laguna Atascosa NWR (Tewes 1986).

Ocelot activity in general begins about sunset and continues intermittently through most of the night, early morning, and until shortly after sunrise. Some diurnal activity was noted during the winter (Tewes and Everett 1982). Other persons working in the field report similar activities.

One radio-tagged ocelot was known to be lactating on three separate occasions (October 1982, June 1983, and November 1983). Another ocelot was known to be lactating in December 1982 (Tewes 1986). A single kitten was found on September 11, 1985. On December 19, 1985, a den with two 3-week old kittens was found just south of Laguna Atascosa NWR (Laack and Rappole 1986). Five of these six parturitions occurred between August and early December, and the sixth was in late spring. Although little knowledge of the length of dependence of kittens on their mother exists, Tewes (1986) found that two subadult females still had considerable home range overlap with their mothers at about 2 years.

To date, remains of nine ocelots have been recovered, and six of the deaths appear attributable to motor vehicle injuries. Five of these road-kills were just south of Laguna Atascosa NWR and the other was a cat dispersing from a private ranch. The cause of death of the three cats that were not hit by vehicles is unknown. Two of these cats were found on Laguna Atascosa NWR and one on Santa Ana NWR.

A necropsy of one of the road-killed specimens revealed no pathological conditions other than insignificant parasitism by ascarids (Toxocara cati)

and tapeworms (Taenia taeniaeformis). Test results for feline leukemia virus and feline infectious peritonitis virus were negative. No moribund ocelots have been observed in existing study areas. However, two moribund bobcats were collected on the Santa Ana NWR, and were necropsied at the National Wildlife Health Lab, Madison, Wisconsin. A definitive reason for the emaciated condition of each specimen was not identified, though numerous notations of pathological conditions were made.

Viral titering of live ocelots to determine their exposure to various feline viral pathogens has been initiated. Blood samples of road-killed and live-trapped ocelots currently are being analyzed (R. Rauch, Refuge Manager, Laguna Atascosa NWR, pers. comm. 1988). Some feline diseases such as feline panleukopenia (distemper) could exert a limiting effect on kitten survivorship. Investigators with the Florida panther recovery effort report a high incidence of Florida panther exposure to panleukopenia, based on titers from captured and road-killed panthers (Roelke et al. 1985). Viral titering of bobcat, raccoon, and other associated carnivores, and additional viral titering of ocelot, need to be performed before further discussion of disease potentials.

PREY: The importance of available prey has not been determined. Tewes and Everett (1982) evaluated potential prey in three habitat types adjacent or within core areas used by two radio-collared ocelots. They found that the Mexican spiny pocket mouse (Liomys irroratus) significantly dominated the brush site and may therefore be an important part of the ocelots' diet. In the brush-grass ecotone, the dominant species were the fulvous harvest

mouse (Reithrodontomys fulvescens) and the pygmy mouse (Baiomys taylori). In the grass habitat, pygmy mice, cotton rats (Sigmodon hispidus) and hispid pocket mice (Perognathus hispidus) codominated. Composition of collected ocelot scats has not been determined.

Other potential prey species include other rodents, opossum (Didelphis virginiana), raccoon (Procyon lotor), javelina (Tayassu tajacu), white-tailed deer (Odocoileus virginianus), skunks (Mephitis spp., Conepatus spp.), nine-banded armadillo (Dasypus novemcinctus), feral swine (Sus scrofa), poultry, quail, doves, chachalaca, numerous passerine birds and waterfowl, colubrid and crotalid snakes, and lizards. Joy (Director, Abilene Zoological Gardens, pers. comm. 1985) reports observing an adult ocelot adeptly attacking a large (2.0 m) Totonacan rattlesnake (Crotalus durissus totonacae). This observation was made near Soto la Marina, Tamaulipas, Mexico, south of Brownsville, Texas, in 1977. Joy subsequently collected the snake, which later died of injuries inflicted by the ocelot.

PREDATORS: Potential predators sympatric with existing ocelot populations include man, feral dogs, coyotes (Canis latrans), bobcats (Felis rufus), mountain lion (Felis concolor), feral swine, large raptors (e.g. great horned owl [Bubo virginianus]), American alligator (Alligator mississippiensis), colubrid constrictors, and crotalid pit vipers. Young ocelots would presumably be more vulnerable than adults to these predators.

COMPETITORS: Competitors for food resources may include the jaguarundi, coyote, fox, bobcat, mountain lion, raptors, and reptiles.

HABITAT CHARACTERISTICS: The current known distribution of ocelots is within the Tamaulipan Biotic Province, which contains many variations of subtropical thornscrub brush. Sightings and trappings have occurred in several different habitat types, all within the Tamaulipan Province. The major plant communities of southernmost Texas are mapped in Figure 12.

Ocelots have been found in four habitat types in the Lower Rio Grande Valley. These include: Mesquite-Granjeno Parks, Mesquite-Blackbrush Brush, Live Oak Woods/Parks, and Rio Grande Riparian.

The total habitat available to ocelots in the Lower Rio Grande Valley is estimated to be less than 20,000 hectares (49,400 ac), with the largest block of thorn forest being the Laguna Atascosa NWR, with 3,352 hectares (8,280 ac) of remaining thorn forest. Laguna Atascosa NWR probably supports 25 to 30 ocelots (R. Rauch, pers. comm. 1987). The remaining habitat in the area exists as numerous smaller thorn forest tracts, most less than 100 hectares (247 ac) and widely separated from other blocks (J. Rappole, Assistant Professor, Caesar Kleberg Wildlife Research Institute, pers. comm. 1985). Lack of corridors between these thorn forest islands may restrict the use of these potential habitat sites.

Within the Tamaulipan Biotic Province lies the South Texas Plain (Rio Grande Plains), within which existing study sites occur. Average annual precipitation in this area ranges from 41 to 89 cm (16 to 35 inches), with sporadic periods of drought and occasional inundation due to tropical storms and hurricanes. Monthly, rainfall is lowest during January and

February and highest in May or June. After a midsummer depression, another peak is reached in September. The South Texas Plain topography is level to rolling and dissected by dry washes oriented towards the Gulf of Mexico. Elevations rise from sea level to 305 m (1001 feet). Soil types range from clay to sandy loams and vary from calcareous to slightly acidic. A wide range of soil profile types is responsible for great differences in soil drainage or moisture retention, and subsequently cover types. Rappole (pers. comm. 1985) maintains that in Cameron County vegetation found in association with Laredo silty clay loam (Williams et al. 1977) provides prime ocelot habitat in that a greater variety of mixed vegetation occurs on this soil type. Typical range sites through South Texas include deep sands, hardlands, shallow ridges, bottomlands, alkali flats, and mixed sandy land.

Historically, the South Texas Plain supported grassland or savanna-type, mixed, climax vegetation with dense mixed brush along dry washes and flood plains of the Rio Grande (Inglis 1964). Overgrazing and other agricultural uses have altered the plant communities to such a degree that severely disturbed brush (thornscrub) communities are dominant in many areas north of the Rio Grande Plain (Johnston 1963). Many tree and shrub species have increased in the area, including mesquite (Prosopis glandulosa), post oak (Quercus stellata), live oak (Q. virginiana), cacti, and several acacias. Although large areas of privately owned lands are cultivated, some areas of rangeland, though altered, still exist north and west of the Rio Grande Plain.

Preferred habitat used by ocelots studied thus far can be characterized as being dense thornscrub. Tewes and Everett (1986) classified prime habitat by three parameters. Class A or optimal habitat consisted of 95% or greater canopy cover of the shrub layer; Class B or suboptimal habitat was 75% to 95% canopy cover; Class C or inadequate cover was 75% or less. Available habitat was quantified by flying aerial transects over most of the lower 13 counties of Texas with follow-up ground verification in some areas. The minimum area required for an area to be classified as suitable habitat was 40 ha (99 ac) per brush stand or 30 ha (74 ac) for two or more proximate brush stands. Little thorn forest classified as optimal habitat for ocelots remains in south Texas (Figure 13).

Four ocelots have been captured in oak woodland-type habitat adjacent to thornscrub communities (Twedt and Rappole 1986, Navarro Lopez 1985). These findings may indicate that the species occupies a broader range of habitat types.

Aerial evaluation, satellite composite evaluation, and ground verification all indicate that very little optimal habitat remains in the current U.S. range of the ocelot (Figure 13). The smallest area continuously occupied by an ocelot was 122 ha (301 ac) in Willacy County (Navarro Lopez 1985). This ocelot was a young male, less than 2 years old. It may have been driven out of its home area by an older male cat whose home range north of the young cat's was disturbed when the landowner cleared 15 ha (37 ac) of brush around a residence structure (J. Rappole,

pers. comm. 1985). The young cat was found 1 month later 10 km (6.2 mi) north of its former home range in oak savanna-type habitat.

Habitat has been lost even within managed refuge areas inhabited by ocelots. It has been common practice to provide grain crops such as sorghum, wheat, clover, Austrian winter peas, corn, and rye grass for overwintering waterfowl along the lower Gulf Coast and Laguna Atascosa NWR. However, the majority of the farm fields (445 ha/1,100 ac) on Laguna Atascosa are on soils that do not produce high quality brush. About 202 ha (500 ac) of the 445 ha (1,100 ac) are suitable for brush and the refuge plans to convert these 202 ha to brush. Some farm fields that are located on the best soils to produce brush have been removed from farming, and the phase-out of farming on the rest of the 202 ha is planned (R. Rauch, pers. comm. 1987). In addition, a little over 3,238 ha (8,000 ac) of Laguna Atascosa NWR are now in brush (R. Rauch, pers. comm. 1987). Much of the refuge's 18,000 ha (45,000 ac) is salt marsh.

CURRENT CORRECTIVE ACTIONS: Land protection is essential to securing long-term survival of the ocelot and other endangered and threatened species in south Texas. Critical cat habitat in the Rio Grande Valley should be identified. A land protection plan should be developed for areas around Laguna Atascosa NWR, the Lower Rio Grande Valley, and counties north of this area to protect important ocelot and jaguarundi habitat. Several areas of undisturbed brushland remain in the southcentral Texas region, and initial surveys in these areas are in progress.

A long-term plan for ecological management of remaining native habitat in the Lower Rio Grande Valley has been formulated by the U.S. Fish and Wildlife Service. The plan outlines in detail the minimum steps necessary to preserve remaining wildlife habitat in a meaningful manner. This plan is included as Appendix II. Two points summarize the plan:

1. At least 40,000 ha (100,000 ac) must come under the control of various wildlife management agencies and under a comprehensive plan to salvage important habitat along the Rio Grande in the Rio Grande Valley. Only about 16,188 ha (40,000 ac) are currently under management authority (B. Hawthorne, Associate Manager - Oklahoma/Texas, FWS, pers. comm. 1989).
2. The 1985 plan states that trends suggest that the remaining Lower Rio Grande Valley brushland in private ownership will be developed within 5 years. In 1990, some brushland in private ownership remains, but it is at risk of being cleared at any time.

The Fish and Wildlife Service has developed a general strategy for managing ocelot habitat. Within the occupied habitat (Figure 9), no activities that potentially could impact an ocelot are allowed, unless the activities are in compliance with the Endangered Species Act.

If an activity is proposed within the potential habitat that could impact the ocelot, a visual inspection should be made of the activity area. If there is a reasonable potential for the ocelot to occur there, a professionally regulated live-trapping project should be conducted to

assess ocelot occurrence, with overview provided by the Fish and Wildlife Service. The trap effort should include the activity area and a ten-mile radius from this area. The magnitude of live-trapping will be guided minimally by the location of known ocelot populations relative to the proposed activity, the presence of ocelot sightings and amount of ocelot habitat present, and the judged impact of the proposed activity.

All live-trapping projects must be authorized by and coordinated with the Fish and Wildlife Service. Any necessary state permits must also be obtained. These guidelines will be refined as additional biological information on the ocelot is acquired.

CONCLUSIONS: Much information has been obtained recently concerning ocelot biology in south Texas. Some data remain to be analyzed, and much more data need to be gathered; therefore, only preliminary conclusions can be drawn now. Tewes and Miller (1987) have identified areas of research that will contribute to the recovery of ocelots.

Habitat loss and fragmentation in Texas, especially along the Rio Grande, critically threaten the long-term survival of the ocelot and jaguarundi in this area. A coordinated effort at recovery of these species must be developed and implemented as soon as possible. Hesitation may result in loss of key habitat and biological corridors necessary for survival of the entire ocelot population (Tewes and Schmidly 1987). Thorough and continued field investigation must continue for many years to approach a complete understanding of the biology of this species.

The survival of this species will depend on the intense and multifaceted cooperation of Federal, state, and private organizations, and private land owners. Early emphasis of this concept will aid implementation of a recovery effort for the ocelot.

PART II

RECOVERY

Studies to determine the status and ecological needs of listed cats in Texas are ongoing, but have not been formally initiated in Arizona. The margay (Felis weidii) no longer occurs in the United States. The margay does occur approximately 200 miles to the south in Mexico. The jaguar (F. onca) has been extirpated from Texas but is still a rare disperser into Arizona. The jaguarundi (F. yagouaroundi) is frequently reported in south Texas with occasional unconfirmed reports in Arizona. Until recently the last confirmed jaguarundi in Texas was captured in 1969 in Willacy County. However, on April 21, 1986, a road-killed specimen was recovered from Cameron County, Texas. The presence of other jaguarundi in the area has not yet been confirmed. The ocelot (F. pardalis) is known from eleven counties in south Texas, and a reproducing population exists on Laguna Atascosa NWR in Cameron County. Ocelots were last confirmed in Arizona in 1964; however, the species' status in the state is largely unknown.

The historic and present status of the margay, jaguar and jaguarundi in the United States is addressed in more detail in Appendix III. Although it is assumed that actions taken to recover the ocelot would also benefit other listed cats, plans for the recovery of these species cannot be

developed until their presence is confirmed. For the present, plans for recovery of the listed cats of Arizona and Texas will have to be limited largely to ocelot preservation.

Criteria for downlisting and delisting of the ocelot are difficult to determine for two reasons. First, the U.S. population is only a small fraction of the overall species and its range. The Texas ocelot population will likely become geographically isolated from the Mexican population in this century as habitat corridors of travel are lost. Secondly, so little is known about the population dynamics and viability of wild felids that we can only estimate numbers and habitat needs. With these limitations in mind, the following step-down outline and narrative recommend preliminary objectives and tasks leading to the downlisting of the ocelot in the United States. As additional data are obtained, more specific downlisting and delisting criteria will be established and refined.

OBJECTIVES:

- I. The Texas population of the ocelot can be delisted when it has reached a level that is considered demographically stable and genetically viable, and when existing and potential threats are eliminated or controlled. If disease epidemics are determined to constitute a significant threat, then the Texas population must consist of at least three demographic units (each must meet viability standards) that are sufficiently separated that disease epidemics would not be likely to be transmitted among them. The impact of disease, precise population numbers and habitat sizes required for

viability, and the necessary habitat spatial arrangement will be determined as individual recovery tasks. The current, although incomplete, understanding of habitat requirements suggests that full recovery and delisting may not be a practical objective, although downlisting to threatened may be attainable.

- II. As a preliminary approach to Objective I, increase ocelot numbers in Texas by protecting at least 20,000 hectares (49,400 ac) of prime ocelot habitat in Texas, either in a single block or continuous blocks connected by corridors that allow sufficient movement for gene flow and recolonization.
- III. Determine ocelot distribution and status in Arizona and the northern states of Mexico. Also, identify the location and status of additional sub-populations of ocelots in Texas.
- IV. Determine status, ecology, and conservation needs of the jaguarundi in Texas, Arizona, and the northern states of Mexico.

STEP-DOWN OUTLINE

- 1. Maintain existing ocelot populations in Texas while continuing status surveys
 - 11. Monitor ocelots in Texas
 - 111. Actively survey known populations
 - 112. Expand surveys in Class I and II sighting areas
 - 113. Assess the status, distribution, and ecology of the ocelot in northern Tamaulipas
 - 12. Gather data on the biology of captured ocelots
 - 121. Radio tag and mark captured ocelots

- 122. Determine habitat use parameters
- 123. Determine potential influence of disease
 - 1231. Serological survey
 - 1232. Survey parasites
 - 1233. Assess general health status
- 124. Determine potential effects of inbreeding
- 125. Assess possible contaminant problems
- 13. Protect and manage occupied habitat
 - 131. Implement an ocelot habitat protection plan
 - 132. Implement plans outlined in U.S. Fish and Wildlife Service Plan for the Lower Rio Grande Valley National Wildlife Refuge
 - 133. Minimize human disturbance on protected habitats
- 14. Identify and protect potential habitat
 - 141. Preserve habitat adjacent to occupied habitat
 - 142. Encourage private sector habitat protection
 - 143. Increase habitat through restoration and restoration research.
 - 144. Identify potential habitat sites in south Texas
 - 145. Identify potential habitat sites in other areas of Texas within the historic range of ocelots
- 15. Develop contingency plans for captive maintenance of unplanned ocelot acquisitions
- 2. Increase ocelot populations and distribution in Texas
 - 21. Identify potential sites for establishing additional populations

- 22. Investigate regulations relating to augmentation of existing populations
- 23. Develop techniques for translocation of new founder stock
 - 231. Translocate and/or reintroduce ocelots to new locations, if suitable habitat exists and ocelots are unable to recolonize naturally
 - 232. Determine parameters for long-term species survival by performing a population viability analysis (PVA)
- 3. Access the status of the jaguarundi in Texas and northern Mexico
 - 31. Survey for jaguarundi
 - 311. Develop better techniques for capturing and documenting jaguarundi
 - 312. Actively survey areas of confirmed presence
 - 313. Expand surveys in Class I and II sighting areas
 - 314. Assess the status, distribution, and ecology of the jaguarundi in northern Tamaulipas
 - 32. Gather data on the biology of captured jaguarundi
 - 321. Radio tag and mark captured jaguarundi
 - 322. Determine habitat use parameters
 - 323. Determine potential influence of disease
 - 3231. Serological survey
 - 3232. Survey parasites
 - 3233. Assess general health status
 - 324. Determine potential effects of inbreeding
 - 325. Assess possible contaminant problems

32. Protect and manage occupied habitat
 331. Implement a jaguarundi habitat acquisition program
 332. Implement objectives outlined in U.S. Fish and Wildlife Service Plan for the Rio Grande Valley National Wildlife Refuge
 333. Minimize human disturbance on protected habitats
 34. Identify and protect potential habitat
 341. Preserve habitat adjacent to occupied habitat
 342. Encourage private sector habitat protection
 343. Increase habitat through restoration and restoration research
 344. Identify potential habitat sites in south Texas
 345. Identify potential habitat sites in other areas of Texas within the historic range of jaguarundi
 35. Develop contingency plans for captive maintenance of unplanned jaguarundi acquisitions
4. Assess the status of listed cats in Arizona and Sonora
41. Monitor listed cats in Arizona and Sonora
 411. Actively survey areas of confirmed presence
 412. Identify and survey in Class I and II sighting areas
 413. Expand surveys of trappers and hunters
 414. Assess the status, distribution, and ecology of listed cats in northern Sonora
 42. Gather data on the biology of captured listed cats
 421. Radio tag and mark captured cats
 422. Determine habitat use parameters

- 423. Determine potential influence of disease
 - 4231. Serological survey
 - 4232. Survey parasites
 - 4233. Assess general health status
- 43. Protect and manage occupied habitat
 - 431. Develop and implement plans to manage occupied habitat
 - 432. Minimize human disturbance on protected habitats
- 44. Identify and protect potential habitat
 - 441. Preserve habitat adjacent to occupied habitat
 - 442. Encourage private sector habitat protection
 - 443. Increase habitat
 - 444. Identify potential habitat sites in Arizona
- 45. Develop contingency plans for captive maintenance of unplanned listed cat acquisitions
- 5. Encourage Mexican authorities and cooperate with them to assess the status, distribution, and ecology of jaguar and margay populations occurring in northern Mexico
- 6. Develop an education and information program

NARRATIVE

1. Maintain existing ocelot populations in Texas while continuing status surveys

11. Monitor ocelots in Texas

Continue surveillance of known populations in south Texas through trapping and photo-documentation.

111. Actively survey known populations

Continued field investigations are essential to gather a broad data base at this stage of the overall investigation.

112. Expand surveys in Class I and II sighting areas

Begin trapping and photo-documentation surveys in Class I and II (Figure 5) sighting areas that have not been surveyed. Potentially prime ocelot habitat within these sighting areas should be identified as soon as possible and surveyed. Techniques to broaden capture probability should be considered and employed where possible.

113. Assess the status, distribution, and ecology of the ocelot in northern Tamaulipas

The ocelot's status, distribution, and ecology in northern Tamaulipas should be assessed as soon as possible, cooperatively with Mexican biologists and government authorities.

12. Gather data on the biology of captured ocelots

Much information remains to be gathered to understand the life history and biology of this species.

121. Radio tag and mark captured ocelots

All captured ocelots should be permanently marked for future identification and photo-identified. Marking can be by tattoo or ear tag. As many ocelots as feasible should be radio-tagged and monitored. Realistic goals for field surveillance of radio-tagged cats should be established. A minimum 20-year commitment should be made to gathering data on the biology of this species through field surveillance.

122. Determine habitat use parameters

Determination of parameters such as territory, home range, and corridor habitat size and distribution are essential to the long-term planning for this species. The habitat type used and the amount needed to support breeding cats should also be determined and described in detail. Other parameters include carrying capacity and interaction with other species within used habitat. Predator and prey associations need to be investigated.

123. Determine potential influence of disease

The presence of at least three other species that can serve as reservoirs of disease agents that may affect ocelots makes monitoring these diseases important in determining disease and mortality patterns in relation to the population dynamics of the ocelot. Results of this monitoring should be considered when managing for the ocelot.

1231. Serological survey

Bacterial, viral, fungal, and other diseases that are possible pathogens of cats should be serologically monitored in captured ocelots, bobcats, feral house cats, raccoons, and other associated carnivores. Testing should initially include feline panleukopenia, calicivirus, and feline infectious peritonitis.

1232. Survey parasites

Ticks, fleas, and other ectoparasites on ocelots and associated carnivores should be identified and quantified. Dead ocelots should be examined for internal parasites, and necropsied for evidence of disease, and tissue samples should be obtained for analysis. Field collected scats should be examined for parasites (as well as food habits).

1233. Assess general health status

A general physical examination of captured ocelots, bobcats, and associated carnivores should be performed. Additionally, serum and whole blood should be taken for baseline data on the health of individuals. Tests should include packed cell volume, plasma protein, and presence of hemoparasites. Guidelines developed from the Florida Panther Recovery Plan should be evaluated for applicability during development of this step.

124. Determine potential effects of inbreeding

Unnaturally low population numbers and social structures may limit gene flow and genetic diversity that may, in turn, limit the future of wildlife populations. Known ocelot populations should be examined for genetic diversity and breeding behavior should be evaluated to determine the feasibility of maintaining viable wild populations.

125. Assess possible contaminant problems

In Texas, the ocelot inhabits areas adjacent to agricultural lands that receive intensive application of various pesticides and herbicides. The Texas Veterinary Medical Diagnostic Laboratory System reported finding 0.71 ppm selenium in a road-killed ocelot's liver. However, they did state that they cannot interpret the significance of this value because they "have not established normal limits for hepatic selenium concentration in ocelots..."

13. Protect and manage occupied habitat

Habitat currently used by ocelots that is now under Federal or state management authority should be protected and modified to enhance probability of continued use by ocelots. A variety of methods should be considered to protect habitat used by ocelots that is not now under Federal or state management authority.

131. Implement an ocelot habitat protection plan

Important ocelot habitat adjacent to Laguna Atascosa NWR and corridors known to be used by ocelots should be protected. A variety of methods to protect this land should be

authority lands should be considered. Predator control or furbearer trapping in areas occupied by the ocelot or jaguarundi could have a significant adverse effect on these populations. Techniques (chemical, mechanical, and other means) lethal to the ocelot and jaguarundi that are used to control predators and collect furbearers should not be used in habitat occupied by either the ocelot or jaguarundi.

14. Identify and protect potential habitat

Unless major habitat sites and supporting corridor habitats are acquired or otherwise protected, it is unlikely that ocelots will exist as more than isolated remnant populations in south Texas.

141. Preserve habitat adjacent to occupied habitat

Loss of habitat adjacent to currently occupied habitat may result in the loss of corridors and the formation of biological barriers to ingress and egress of ocelots within a deme. This habitat may be particularly important around Laguna Atascosa NWR where the largest known ocelot population exists and where five cats have been hit by vehicles when the cats left the refuge.

142. Encourage private sector habitat protection

Habitat that cannot be obtained or managed by conventional methods must be managed by the owner. Intense efforts to educate and work with owners in managing their lands in a manner beneficial to ocelots must be made.

143. Increase habitat through restoration and restoration research

Non-usable habitat that is adjacent to occupied or potential habitat and under management authority should be modified to enhance use by ocelots. Agricultural areas and practices on Federal lands should be examined to identify modifications that would benefit wild ocelots. Modifications of current agricultural practices on Federal refuge land should be considered from two standpoints: first, to enhance ocelot use and thereby increase total usable habitat for these cats, and second, to develop models for educating private landowners in developing multiuse habitats on their lands. Ocelot habitat creation on lands not currently under management authority should also be attempted. A variety of methods may be feasible for accomplishing this task, including working with local landowners. The creation of travel corridors between suitable habitat should especially be attempted.

144. Identify potential habitat sites in south Texas

Tracts of potentially suitable habitat should be identified for potential future use in the recovery effort. Such sites may exist in Jim Wells, Live Oak, and McMullen Counties. Initial plans for protection of potential habitat sites should be considered by cooperating management authorities.

145. Identify potential habitat sites in other areas of Texas within the historic range of ocelots

Potential habitat sites outside the Tamaulipan Biotic Province should be identified, but plans for management authority should be delayed until ocelot population stabilization is accomplished in south Texas, unless such plans affect other needs.

15. Develop contingency plans for captive maintenance of unplanned ocelot acquisitions

A protocol should be developed early in the recovery effort to care for unplanned ocelot acquisitions that may occur through such situations as border confiscations, field emergencies, vehicle trauma cases, or other injury or debilitation. At least temporary captive maintenance of such specimens is humanely and scientifically warranted.

2. Increase ocelot populations and distribution in Texas

The current major ocelot population on Laguna Atascosa NWR appears to be secure within the refuge boundary. However, as this habitat becomes full and cats disperse from the refuge they are having trouble finding sufficient habitat or a safe corridor to sufficient habitat, limiting the potential for expansion of this population. Therefore, the establishment of additional populations should be considered.

21. Identify potential sites for establishing additional population

Results from ongoing studies will be used in selecting specific sites.

22. Investigate regulations relating to augmentation of existing populations

Review legal requirements for capture and translocation, captive holding, and release of wild obtained cats.

23. Develop techniques for translocation of new founder stock

Before large scale translocations occur, translocation of a few ocelots should be attempted to develop the techniques.

231. Translocate and/or reintroduce ocelots to new locations

Careful evaluation should be made of which cats to translocate. Cats likely to disperse, with an increased mortality risk (due to such things as crossing roads), should be used. Translocation should be into areas with suitable habitat that do not contain ocelots. Translocation techniques for wild cats must be evaluated and monitored by field personnel.

232. Determine parameters for long-term species survival by performing a population viability analysis (PVA)

Parameters for population levels and a sufficient genetic base for long-term species survival should be developed with the idea that the Texas ocelot population will likely become geographically isolated from the Mexican population in this century.

3. Assess the status of the jaguarundi in Texas and northern Mexico

The recent road-killed jaguarundi in Cameron County, Texas, indicates that the species may still exist in the state. The status of any existing populations in the wild must be determined before a management plan can be focused on this species.

31. Survey for jaguarundi

Survey for possible populations in south Texas through capture and photo-documentation.

311. Develop better techniques for capturing and documenting jaguarundi

Despite an intensive trap program for ocelots and jaguarundis in south Texas, no jaguarundi have been caught. Different techniques may be necessary for capturing and/or documenting jaguarundi.

312. Actively survey areas of confirmed presence

Set-cameras and other means must be used to determine the presence of additional jaguarundi in the area of the recently road-killed specimen and in areas where there have been credible sightings.

313. Expand surveys in Class I and II sighting areas

Begin trapping and photo-documentation surveys in Class I and II sighting areas that have not been surveyed.

Potential jaguarundi habitat within these sighting areas

should be identified as soon as possible and surveyed. Techniques to broaden the capture probability should be considered and use! where possible.

314. Assess the status, distribution, and ecology of the jaguarundi in northern Tamaulipas

The status, distribution, and ecology of the jaguarundi in northern Tamaulipas should be assessed as soon as possible, cooperatively with Mexican biologists and government authorities.

32. Gather data on the biology of captured jaguarundi

With data collected on only one decomposed jaguarundi in the U.S., we lack sufficient information to understand the life history and biology of this species.

321. Radio tag and mark captured jaguarundi

All captured jaguarundi should be permanently marked for future identification and photo-identified. Marking can be by tatoo or ear tag. As many jaguarundi as feasible should be radio-tagged and monitored and realistic goals for field surveillance established. A minimum 20-year commitment should be made to gathering data on the biology of this species through field surveillance.

322. Determine habitat use parameters

Determination of parameters such as territory, home range, and corridor habitat size and distribution are essential to the long-term planning for this species. The habitat type used and the amount needed to support breeding cats should

also be determined and described in detail. Other parameters include carrying capacity and interaction with associated species. Predator and prey relationships need to be investigated.

323. Determine potential influence of disease

The presence of at least three other species that can serve as reservoirs of disease agents that may affect jaguarundi makes monitoring these diseases important in determining their disease and mortality effects on the population dynamics of the jaguarundi. Results of this monitoring should be considered when managing for jaguarundi.

3231. Serological survey

Bacterial, viral, fungal, and other diseases that are possible pathogens of cats should be serologically monitored in captured jaguarundi, ocelots, bobcats, feral house cats, raccoons, and other associated carnivores. Testing should initially include feline panleukopenia, calicivirus, and feline infectious peritonitis.

3232. Survey parasites

Ticks, fleas, and other ectoparasites on jaguarundi and associated carnivores should be identified and quantified. Dead jaguarundi should be examined for

internal parasites, and necropsied for evidence of disease, and tissue samples obtained for analysis.

Field collected scats should be examined for parasites (as well as food habits).

3233. Assess general health status

A general physical examination of captured jaguarundi, ocelots, bobcats, and associated carnivores should be performed. Additionally, serum and whole blood should be taken for baseline data on the health of individuals. Tests should include packed cell volume, plasma protein, and presence of hemoparasites.

Guidelines developed from the Florida Panther Recovery Plan should be evaluated for applicability during development of this step.

324. Determine potential effects of inbreeding

Unnaturally low population numbers and social structures may limit gene flow and genetic diversity that may, in turn, limit the future of wildlife populations. Known jaguarundi populations should be examined for genetic diversity and breeding behavior should be evaluated to determine the feasibility of maintaining viable wild populations.

325. Assess possible contaminant problems

In Texas, the jaguarundi inhabits areas adjacent to agricultural lands that receive intensive application of various pesticides and herbicides.

33. Protect and manage occupied habitat

Habitat used by jaguarundi that is under Federal or state management authority should be protected and managed to enhance probability of continued use by jaguarundi.

331. Implement a jaguarundi habitat acquisition program

Other habitat found to be used by jaguarundi, outside the scope of the Lower Rio Grande plan, should be protected.

332. Implement plans outlined in U.S. Fish and Wildlife Service plan for the Lower Rio Grande Valley National Wildlife Refuge

The goals outlined in this plan should be attained as soon as possible. Addition of important habitat likely to be used by the jaguarundi is essential to population survival of this species in south Texas. Loss of target habitat to other uses such as agriculture and development is a distinct possibility and once lost, future retrieval is unlikely.

333. Minimize human disturbance on protected habitats

Normal recreational activities on Federal lands will not affect jaguarundi in most cases. However, plans to alter jaguarundi habitat for recreational purposes should be carefully reviewed. Establishment of even minimal picnic areas in occupied habitat areas may significantly alter use by jaguarundi. Normal hunting programs on management authority lands do not appear to be a negative factor in the preservation of jaguarundi. However, cautions to hunters on management authority lands should be considered. Predator

control or furbearer trapping in areas occupied by the ocelot or jaguarundi could have a significant adverse effect on these populations. Techniques (chemical, mechanical, and other means) lethal to the ocelot and jaguarundi that are used to control predators and collect furbearers should not be used in habitat occupied by either the ocelot or jaguarundi.

34. Identify and protect potential habitat

Unless major habitat sites and supporting corridor habitats are acquired and protected, it is unlikely that jaguarundi will exist as more than isolated remnant populations in south Texas.

341. Preserve habitat adjacent to occupied habitat

Loss of habitat adjacent to occupied habitat may result in the loss of corridors and the formation of biological barriers to ingress and egress of jaguarundi within a deme.

342. Encourage private sector habitat protection

Habitat that cannot be obtained or managed by conventional methods must be managed by the owner. Intense efforts to educate and work with owners in managing their lands in a manner beneficial to jaguarundis must be made.

343. Increase habitat through restoration and restoration research

Non-usable habitat that is adjacent to occupied or potential habitat and under management authority should be modified to enhance use by jaguarundi. Agricultural areas and practices on Federal lands should be examined to identify

modifications that would benefit wild jaguarundis.

Modifications of current agricultural practices on Federal refuge land should be considered from two standpoints: first, to enhance jaguarundi use and thereby increase total usable habitat for these cats, and second, to develop models for educating private landowners in developing multiuse habitats on their lands. Jaguarundi habitat creation on lands not currently under management authority should also be attempted. A variety of methods may be feasible for accomplishing this task, including working with local landowners. The creation of travel corridors between suitable habitat should especially be attempted.

344. Identify potential habitat sites in south Texas

Tracts of potentially suitable habitat should be identified for potential future use in the recovery effort. Initial plans for protection of potential habitat sites should be considered by cooperating management authorities.

345. Identify potential habitat sites in other areas of Texas within the historic range of jaguarundi

Potential habitat sites outside the Tamaulipan Biotic Province should be identified, but plans for management authority should be delayed until jaguarundi population stabilization is accomplished in south Texas, unless such plans affect other needs.

35. Develop contingency plans for captive maintenance of unplanned jaguarundi acquisitions

A protocol should be developed early in the recovery effort to care for unplanned jaguarundi acquisition that may occur through such situations as border confiscations, field emergencies, vehicle trauma cases, or other injury or debilitation. At least temporary captive maintenance of such specimens is humanely and scientifically warranted.

4. Assess the status of listed cats in Arizona and Sonora

Evidence indicates that at least the ocelot continues to exist in Arizona and adjacent areas of Sonora, Mexico. However, the status and distribution of listed cats in the area is essentially unknown and must be investigated before recovery actions can be initiated.

41. Monitor listed cats in Arizona and Sonora

Initiate surveys to determine the probable distribution of listed cats in Arizona. Although all species should be evaluated, initial emphasis should be on ocelot distribution.

411. Actively survey areas of confirmed presence

Areas where listed cats have been reported as captured should be actively surveyed through the use of set-cameras and/or traps.

412. Identify and survey in Class I and II sighting areas

Arizona sightings that meet the Class I and II criteria employed in south Texas should be evaluated through photo-documentation and/or trapping. Potentially prime habitat for listed cats within these sighting areas should be

identified as soon as possible and subsequently surveyed. Techniques to broaden the capture probability should be considered and employed where possible.

413. Expand surveys of trappers and hunters

Use mail questionnaires and interview surveys to establish if Class I areas exist peripheral to identified Class I and II sighting areas. Develop and implement a public information program to assist in obtaining unsolicited information.

414. Assess the status, distribution, and ecology of listed cats in northern Sonora

The status, distribution, and ecology of listed cats in northern Sonora should be assessed as soon as possible, cooperatively with Mexican biologists and government authorities.

42. Gather data on the biology of captured listed cats

Much information remains to be gathered on the ocelot and other listed cats to understand the life history and biology of these species. Data gathered in Arizona should be compared with those gathered in Texas to determine areas of similarity as well as differences.

421. Radio tag and mark captured cats

All captured cats should be permanently marked for future identification and photo-identified. Marking can be by

tattoo or ear tag. As many cats as feasible should be radio-tagged and monitored. Realistic goals for field surveillance of radio-tagged cats should be established.

422. Determine habitat use parameters

Determination of parameters such as territory, home range, and corridor habitat size and distribution are essential to the long-term planning for these species. The habitat type used and the amount needed to support breeding cats should also be determined and described in detail. Other parameters include carrying capacity and interaction with other species within used habitat. Predator-prey associations need to be investigated.

423. Determine potential influence of disease

The presence of other species that can serve as reservoirs of disease agents that may affect listed cats makes monitoring these diseases important in determining disease and mortality patterns in relation to population dynamics. Results of this monitoring should be considered when managing for the listed cats.

4231. Serological survey

Bacterial, viral, fungal and other diseases that are possible pathogens of cats should be serologically monitored in captured listed cats, bobcats, feral house cats, raccoons, and other associated carnivores. Testing should initially include feline panleukopenia, calicivirus, and feline infectious peritonitis.

4232. Survey parasites

Ticks, fleas, and other ectoparasites on captured listed cats and other carnivores should be identified and quantified. Dead listed cats should be examined for internal parasites, necropsied for evidence of disease, and tissue samples should be obtained for complete analyses. Field collected scats should be examined for parasites (as well as food habits).

4233. Assess general health status

A general physical examination of captured listed cats, bobcats, and associated carnivores should be performed. Additionally, serum and whole blood should be obtained for baseline data on the health of individuals. Tests should include packed cell volume, plasma protein, and presence of hemoparasites.

Guidelines developed from the Florida Panther Recovery Plan should be evaluated for applicability during development of this step.

43. Protect and manage occupied habitat

Habitat currently used by listed cats that is now under Federal or state management authority should be protected and modified to enhance probability of continued use.

431. Develop and implement plans to manage occupied habitat

Plans developed should outline actions to be taken to manage occupied habitat as soon as such habitat is identified.

Plans should also provide for the management of important

habitat adjacent to occupied habitats. Loss of target habitat to other uses such as agriculture and development is a distinct possibility, and once lost future retrieval is unlikely.

432. Minimize human disturbance on protected habitats

Normal recreational activities on Federal lands will not affect listed cats in most cases. However, plans to alter used habitat for recreational purposes should be carefully reviewed. Establishment of even minimal picnic areas in occupied habitat areas may significantly alter use by listed cats. Normal hunting programs on management authority lands do not appear to have any negative impacts on listed cats. However, cautions to hunters on management authority lands should be considered. Predator control or furbearer trapping in areas containing ocelot or jaguarundi could have a significant effect on these populations. Techniques (chemical, mechanical, and other means) lethal to the ocelot and jaguarundi that are used to control predators and collect furbearers should not be used in habitat occupied by either the ocelot or jaguarundi.

44. Identify and protect potential habitat

Unless major habitat sites and supporting corridor habitats are identified and protected, it is unlikely that listed cats will exist as more than isolated remnant populations in Arizona.

441. Preserve habitat adjacent to occupied habitat

Loss of habitat adjacent to occupied habitat may result in the loss of corridors and the formation of biological barriers to ingress and egress of listed cats within a deme.

442. Encourage private sector habitat protection

Habitat that cannot be obtained or managed by conventional methods must be managed by the owner. Intense efforts to educate and work with owners in managing their lands in a manner beneficial to listed cats must be made.

443. Increase habitat

Non-usable habitat that is adjacent to occupied habitat and under management authority should be modified to enhance use by listed cats. Agriculture areas present on Federal lands should be examined to identify modifications that would benefit wild listed cats. Modifications of current agricultural practices on Federal land should be considered from two standpoints. Modification should enhance listed cat use and thereby increase total usable habitat.

Modifications could be used as a model in educating private landowners in developing multiuse habitats on their lands.

444. Identify potential habitat sites in Arizona

Large tracts of potentially suitable habitat should be identified for potential future use in the recovery effort. Initial plans for protection of potential habitat sites should be considered by cooperating management authorities.

45. Develop contingency plans for captive maintenance of unplanned listed cat acquisitions

A protocol should be developed early in the recovery effort to care for unplanned listed cat acquisitions that may occur through such situations as border confiscations, field emergencies, vehicle trauma cases, or other injury or debilitation. Captive maintenance of such specimens is humanely and scientifically warranted.

5. Encourage Mexican authorities and cooperate with them to assess the status, distribution and ecology of jaguar and margay populations occurring in northern Mexico

The status, distribution, and ecology of jaguar and margay populations occurring near the United States should be examined. Jaguars historically occupied areas within Texas and Arizona. They may still be immigrating into the United States from Mexico.

6. Develop an education and information program

Listed cats are essentially non-controversial species and public attitude can be expected to be positive. However, land management issues relating to their survival will be at issue in some instances. The Information and Education (I&E) program should focus on the listed cats and on the need to preserve and manage habitat for the benefit of listed cats. Slide/tape presentations, video or film presentations, brochures, and other media could be used.

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PART III

IMPLEMENTATION SCHEDULE

The Implementation Schedule that follows is a summary of scheduled actions and costs for the listed cats of Texas and Arizona recovery program. It is a guide to meet the objectives of the recovery plan for these species, as elaborated upon in Part II, Narrative. This schedule indicates the general category for implementation (I = information gathering, M = management, A = acquisition, O = other), recovery plan tasks, corresponding action outline numbers, task priorities, duration of the tasks ("ongoing" means that once the task is begun it will be conducted on an annual basis), the agencies responsible for performing these tasks, and the estimated costs for FWS tasks. Part III is the action of the recovery plan, that when accomplished, should lead toward the recovery of the listed cats of Texas and Arizona and protection of their habitats. It should be noted that monetary needs for agencies other than FWS are not identified and therefore Part III does not reflect the total financial requirements for the recovery of these species.

Recovery Action Priorities

Priorities in column four of the implementation schedule are assigned using the following guidelines:

- 1 = Actions absolutely necessary to prevent extinction of the species.
- 2 = Actions necessary to maintain the species' current population status.
- 3 = All other actions necessary to provide for full recovery of the species.

Abbreviations Used

FWS	-	USDI Fish and Wildlife Service
		SE - Division of Endangered Species
		ES - Ecological Services Field Office
		RW - Division of Refuges and Wildlife
		LE - Division of Law Enforcement
BLM	-	USDI Bureau of Land Management
FS	-	USDA Forest Service
AZ	-	Arizona Game and Fish Department
TX	-	Texas Parks and Wildlife Department
CKWRI	-	Caesar Kleberg Wildlife Research Institute
AAZPA	-	American Association of Zoological Parks and Aquariums

GENERAL CATEGORIES FOR IMPLEMENTATION SCHEDULE

Information Gathering - I or R (Research)

1. Population status
2. Habitat status
3. Habitat requirements
4. Management techniques
5. Taxonomic studies
6. Demographic studies
7. Propagation
8. Migration
9. Predation
10. Competition
11. Disease
12. Environmental contaminant
13. Reintroduction
14. Other information

Management - M

1. Propagation
2. Reintroduction
3. Habitat maintenance and manipulation
4. Predator and competitor control
5. Depredation control
6. Disease control
7. Other management

Acquisition - A

1. Lease
2. Easement
3. Management agreement
4. Exchange
5. Withdrawal
6. Fee title
7. Other

Other - O

1. Information and education
2. Law Enforcement
3. Regulations
4. Administration

IMPLEMENTATION SCHEDULE

GENERAL CATEGORY	PLAN TASK	TASK #	PRIORITY #	TASK DURATION **	RESPONSIBLE AGENCY			FISCAL YEAR COSTS (EST.)*		
					FWS	OTHER	REGION PROGRAM	FY1	FY2	FY3
I1	Monitor ocelots in Texas	11	2	ongoing	2	SE ES RW	TX CKWRI	8,000	8,000	8,000
I4, I5	Radio tag ocelots	121	2	ongoing	2	SE RW	TX CKWRI	10,000	10,000	10,000
I3	Determine habitat use parameters	122	2	ongoing	2	SE RW	TX CKWRI	10,000	10,000	10,000
I11	Determine potential influ- ence of disease	123	2	ongoing	2	SE RW	TX CKWRI	1,000	1,000	1,000
I14	Determine effects of inbreeding	124	3	10	2	SE RW	TX CKWRI AAZPA	500	500	500
I12	Assess contaminant problem	125	2	ongoing	2	SE RW		700	700	700
M3	Protect and manage occupied habitat	13	1	ongoing	2	SE ES RW LE	TX	5,000	5,000	5,000
M3	Identify and protect potential habitat	14	2	ongoing	2	SE ES RW	TX CKWRI	5,000	5,000	5,000

*Costs refer to USFWS expenditures only.

**Task duration is in years.

IMPLEMENTATION SCHEDULE

GENERAL CATEGORY	PLAN TASK	TASK #	PRIORITY #	TASK DURATION **	RESPONSIBLE AGENCY			FISCAL YEAR COSTS (EST.) *		
					FWS	OTHER	REGION PROGRAM	FY1	FY2	FY3
M7	Develop plan for unplanned captive maintenance	15	3	1	2	SE	TX CKWRI AAZPA	500	500	500
M2	Increase ocelot populations and distribution in Texas	2	2	10	2	SE ES RW	TX CKWRI AAZPA	30,000	30,000	30,000
I1	Survey for jaguarundi	31	2	ongoing	2	SE ES RW	TX CKWRI	5,000	5,000	5,000
I4, I5	Radio tag jaguarundi	321	2	ongoing	2	SE RW	TX CKWRI	5,000	5,000	5,000
I3	Determine habitat use parameters	322	2	ongoing	2	SE RW	TX CKWRI	2,000	2,000	2,000
I11	Determine potential influence of disease	323	2	ongoing	2	SE RW	TX CKWRI	500	500	500
I14	Determine effects of inbreeding	324	3	10	2	SE RW	TX CKWRI AAZPA	500	500	500

*Costs refer to USFWS expenditures only.

**Task duration is in years.

IMPLEMENTATION SCHEDULE

GENERAL CATEGORY	PLAN TASK	TASK #	PRIORITY #	TASK DURATION **	RESPONSIBLE AGENCY			FISCAL YEAR COSTS (EST.) *		
					FWS	OTHER		FY1	FY2	FY3
						REGION	PROGRAM			
I12	Assess contami- nant problem	325	2	ongoing	2	SE RW		500	500	500
M3	Protect and manage occupied habitat	33	2	ongoing	2	SE ES RW LE	TX	5,000	5,000	5,000
M3	Identify and protect potential habitat	34	2	ongoing	2	SE ES RW	TX CKWRI	4,000	4,000	4,000
M7	Develop plan for unplanned captive main- tenance	35	3	1	2	SE	TX CKWRI AAZPA	500	500	500
I1	Monitor listed cats in Arizona and Sonora	41	2	10	2	SE ES RW	AZ BLM FS	20,000	20,000	20,000
I4, I5	Radio tag captured cats	421	2	20	2	SE ES RW	AZ	10,000	10,000	10,000
I3	Determine habitat use parameters	422	2	5	2	SE ES	AZ BLM FS	4,000	4,000	4,000

*Costs refer to USFWS expenditures only.

**Task duration is in years.

IMPLEMENTATION SCHEDULE

GENERAL CATEGORY	PLAN TASK	TASK #	PRIORITY #	TASK DURATION **	RESPONSIBLE AGENCY			FISCAL YEAR COSTS (EST.)*		
					FWS	OTHER		FY1	FY2	FY3
						REGION PROGRAM				
I11	Determine potential influence of disease	423	2	10	2	SE	AZ	1,000	1,000	1,000
M3	Protect and manage occupied habitat	43	2	20	2	SE ES RW LE	AZ BLM FS	3,000	3,000	3,000
M3	Identify and protect potential habitat	44	2	20	2	SE ES RW	AZ BLM FS	1,000	1,000	1,000
M7	Develop plan for unplanned captive maintenance	45	3	1	2	SE	AZ AAZPA	500	500	500
I1	Assess status of jaguar and margay in Mexico	5	3	3	2	SE ES RW	CKWRI	10,000	10,000	10,000
01	Education and information program	6	3	ongoing	2	SE ES RW	AZ TX CKWRI AAZPA	1,000	1,000	1,000

*Costs refer to USFWS expenditures only.

**Task duration is in years.

Appendix I - Figures Cited in Text



Figure 1. Photograph of mature Texas ocelot, Felis pardalis, following radio-tagging (Photo by Mike Tewes).

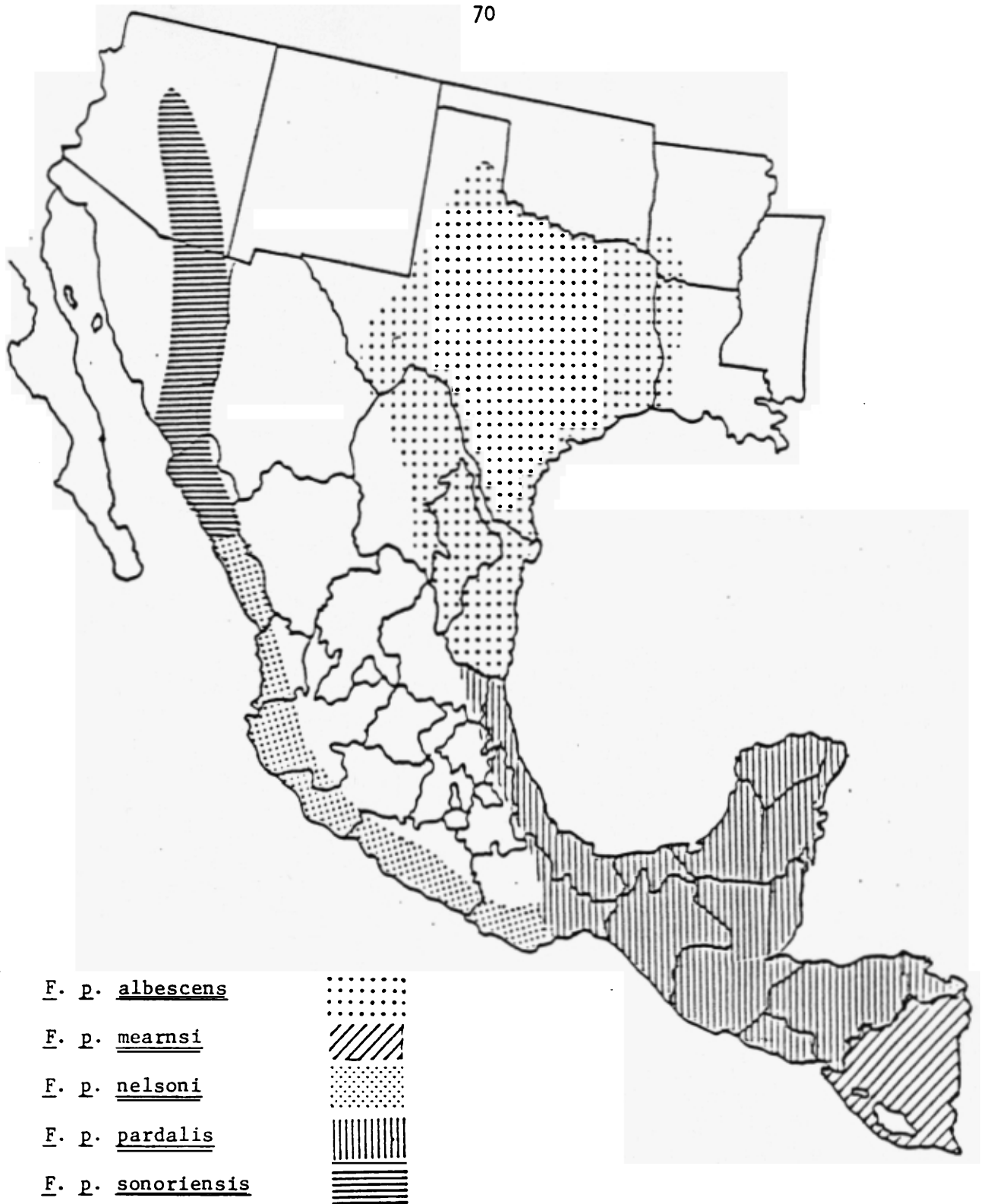


Figure 2. Historic ranges of the five North American races of the ocelot, *Felis pardalis* (from Hall 1981).

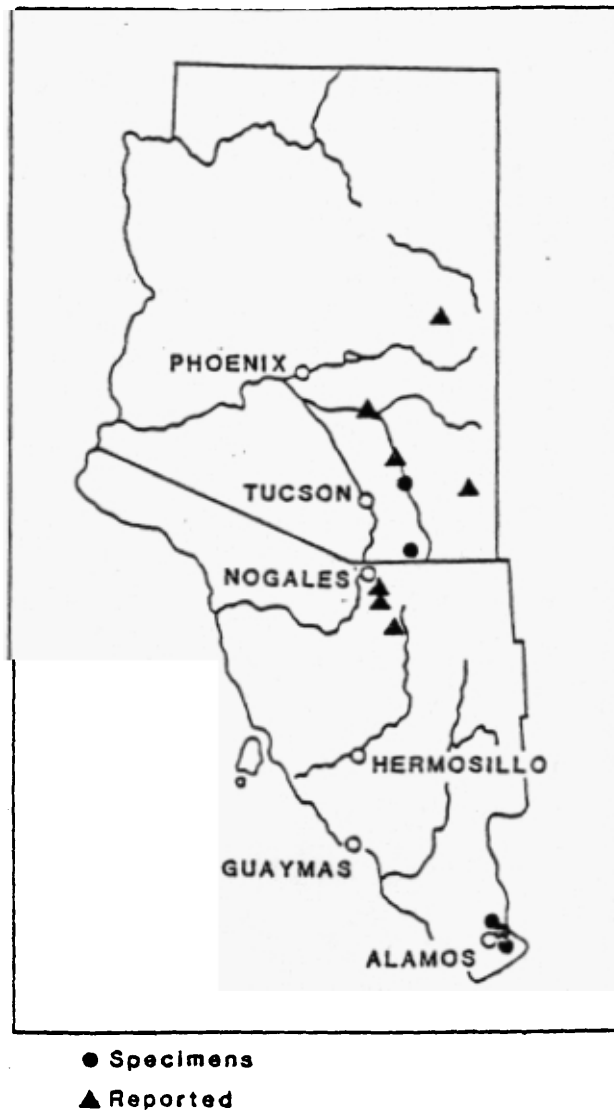


Figure 3. Reports of ocelots in Arizona and Sonora, from Brown, 1985a.

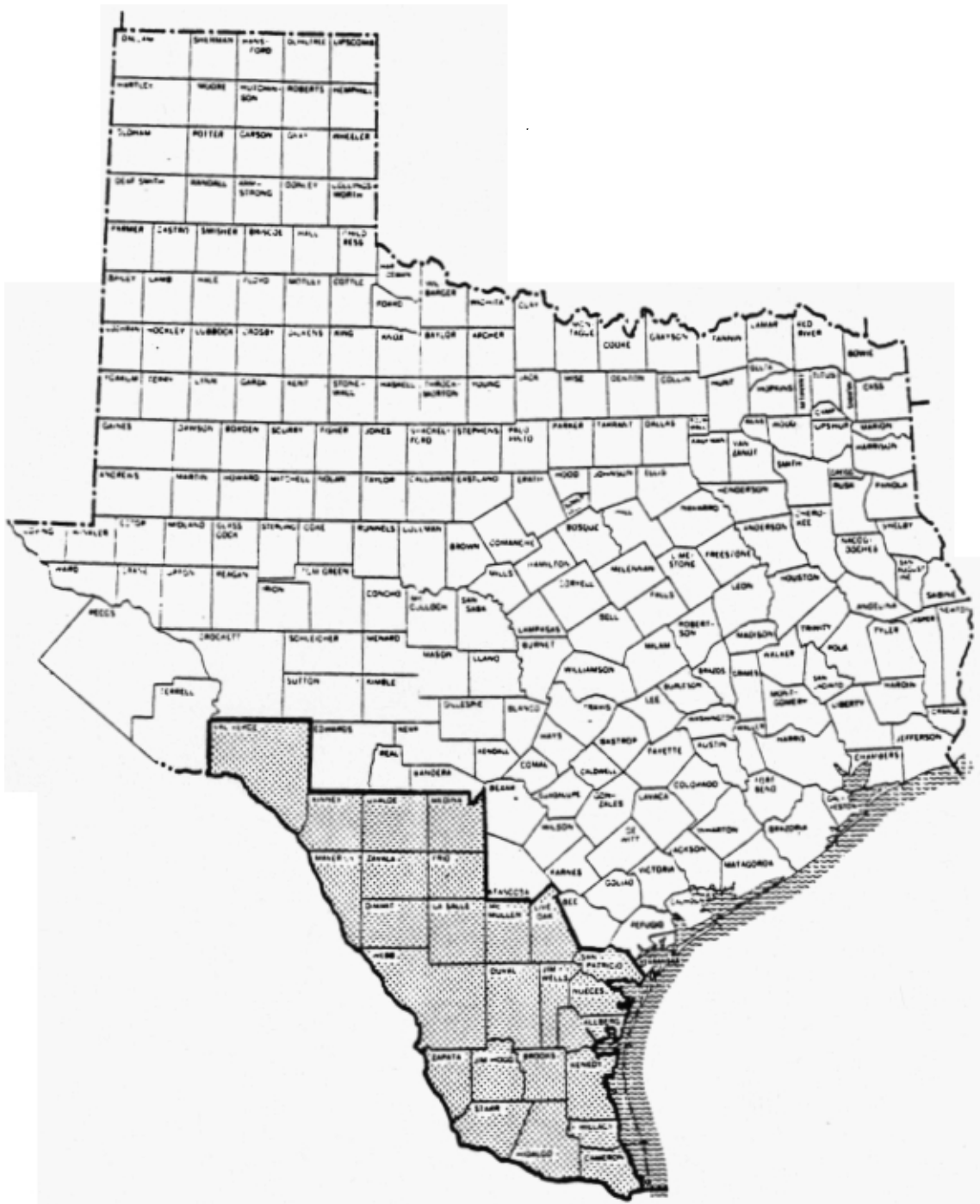


Figure 4. Area of trapper survey conducted by Tewes and Everett (1986).

Figure 5. Criteria used by Tewes and Everett (1986) to evaluate ocelot sightings in the lower 13 counties of Texas.

CRITERIA TO EVALUATE SIGHTINGS		
	<u>Rating</u>	
Class I	10	Cat is in my possession or seen by me.
	9	Cat in possession of observer (via trapping, hunting, treeing by hounds, or a road-kill) and seen by second observer, or evidence seen by me (i.e. photograph, pelage, skull).
	8	Cat in possession of observer and observer seems reliable or cat observed by 2 or more reliable individuals.
Class II	7	Detailed description of event provided and the observer seems reliable.
	6	Observer is "experienced in the outdoors" or is accustomed to looking for details (i.e. biologist, trapper, bird watcher, game warden, hunter).
	5	Observer is not "experienced in the outdoors."
Class III	4	Details of observer are vague and not specific or account is inconsistent.
	3	Observer seems to have questionable credibility and exaggerates other events.
	2	Observer describes an animal other than an ocelot or jaguarundi.
	1	Observation is of no value.

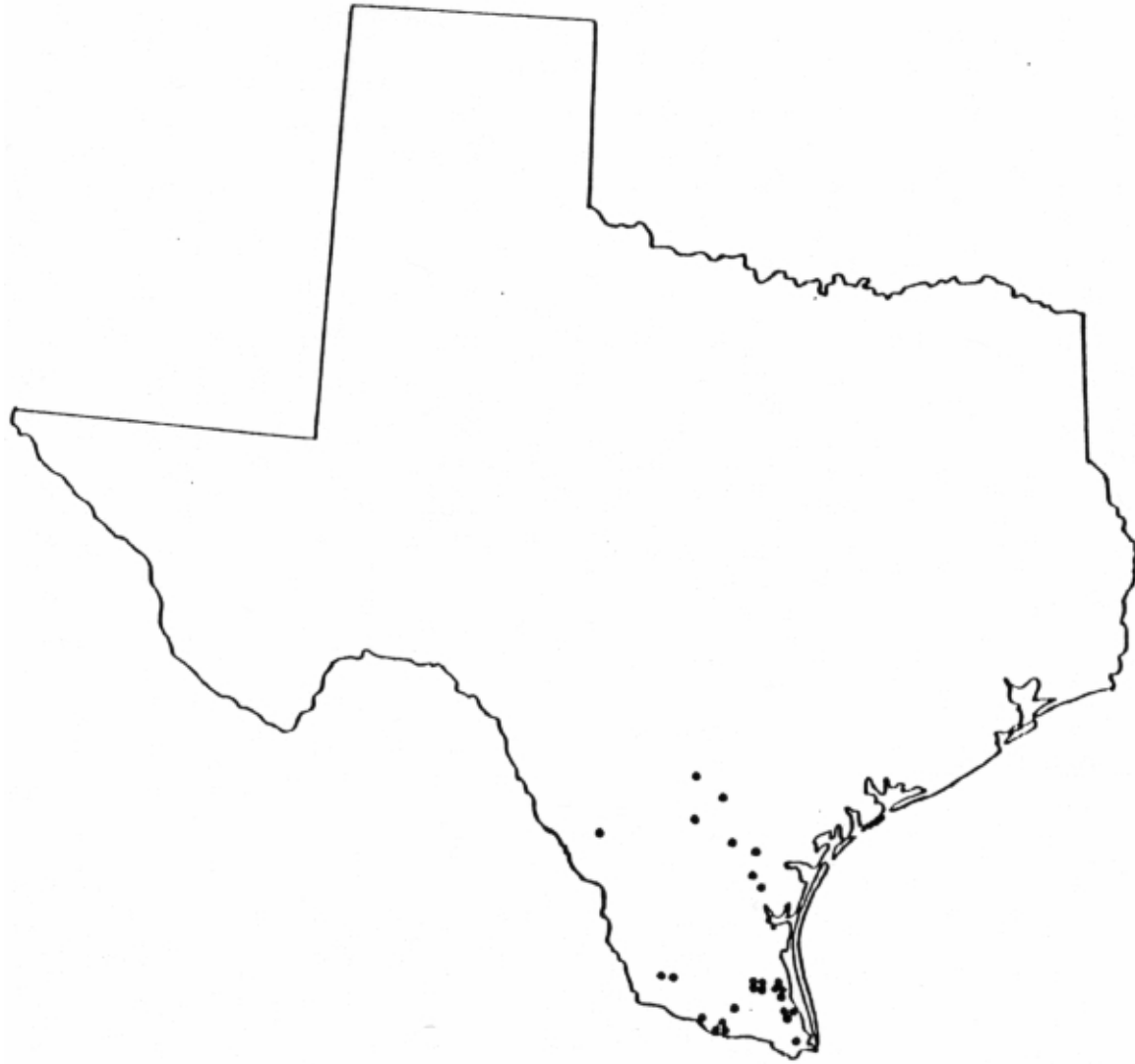


Figure 6. Approximate locations of Class I ocelot reports (Tewes and Everett 1986).

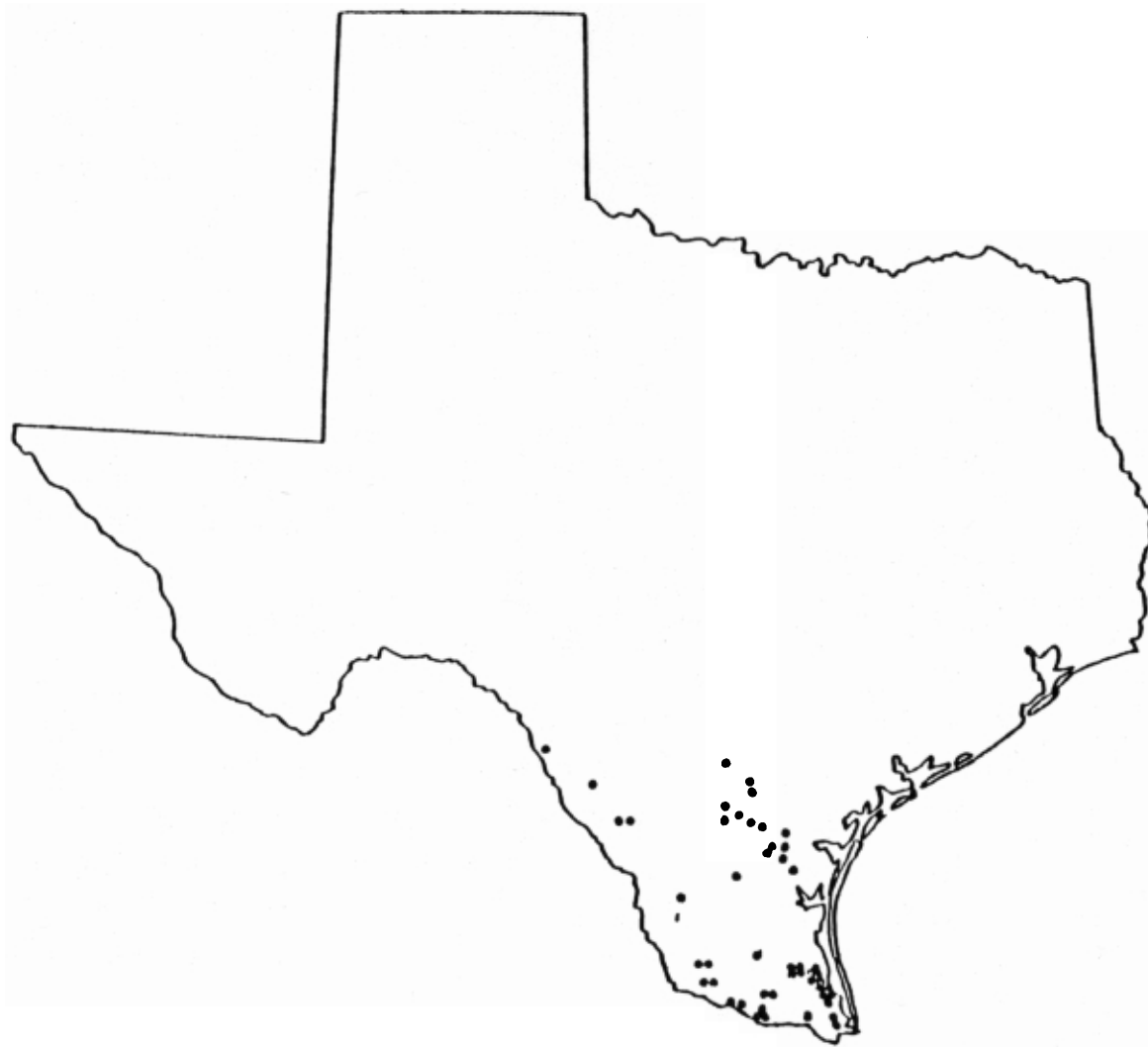


Figure 7. Approximate locations of Class I and II ocelot reports (Tewes and Everett 1986).

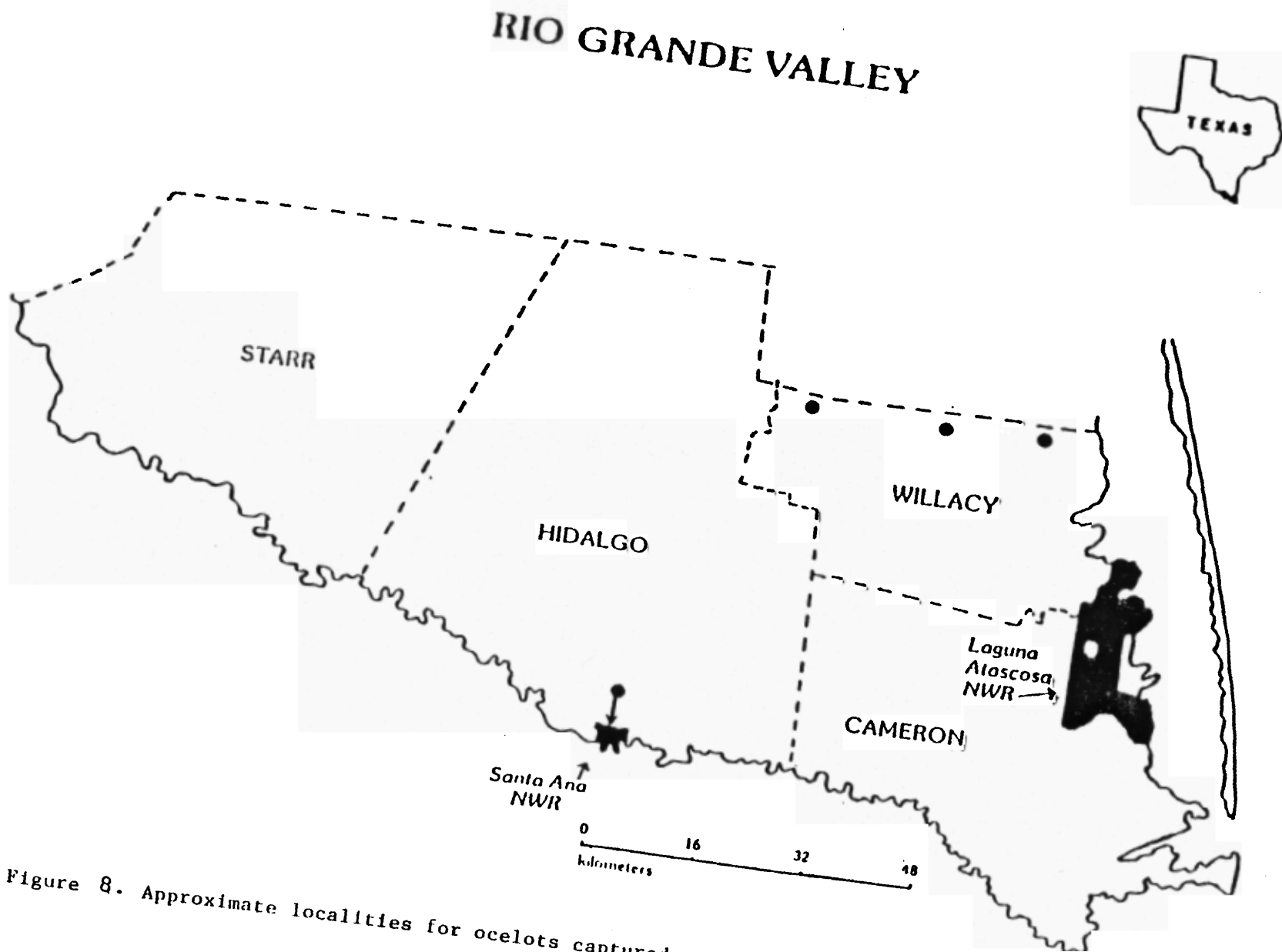


Figure 8. Approximate localities for ocelots captured up to June 1, 1985 in South Texas.

OCELOT HABITAT IN TEXAS

U.S. FISH AND WILDLIFE SERVICE, JUNE 1990

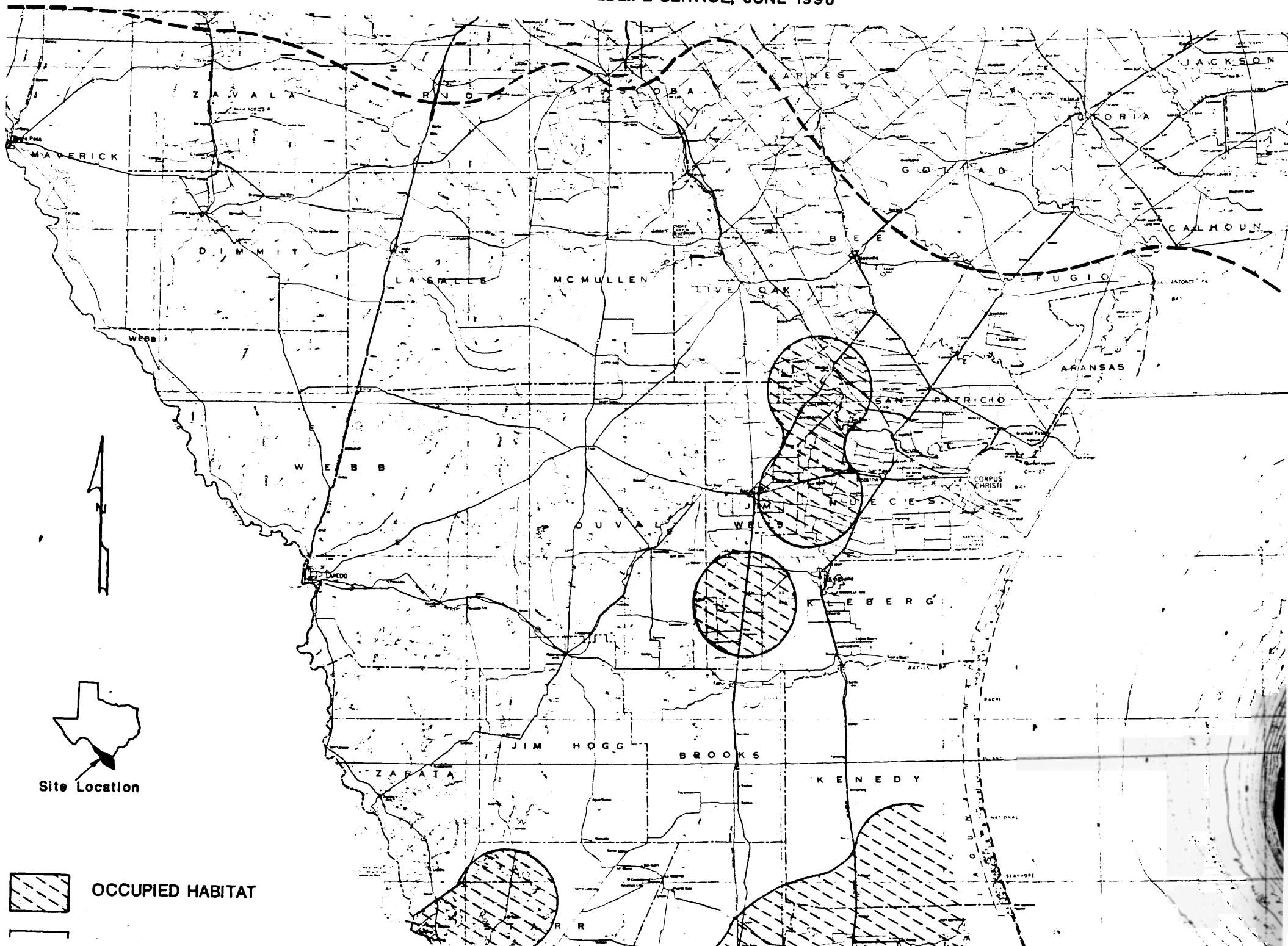




Figure 10. Tomahawk live trap with ocelot. A live chicken and occasionally a feline lure are used as bait in the cage attached to one end of the trap. (Photo by Mike Tewes).



Figure 11a. Heat/motion sensor activates camera apparatus placed along game trails.

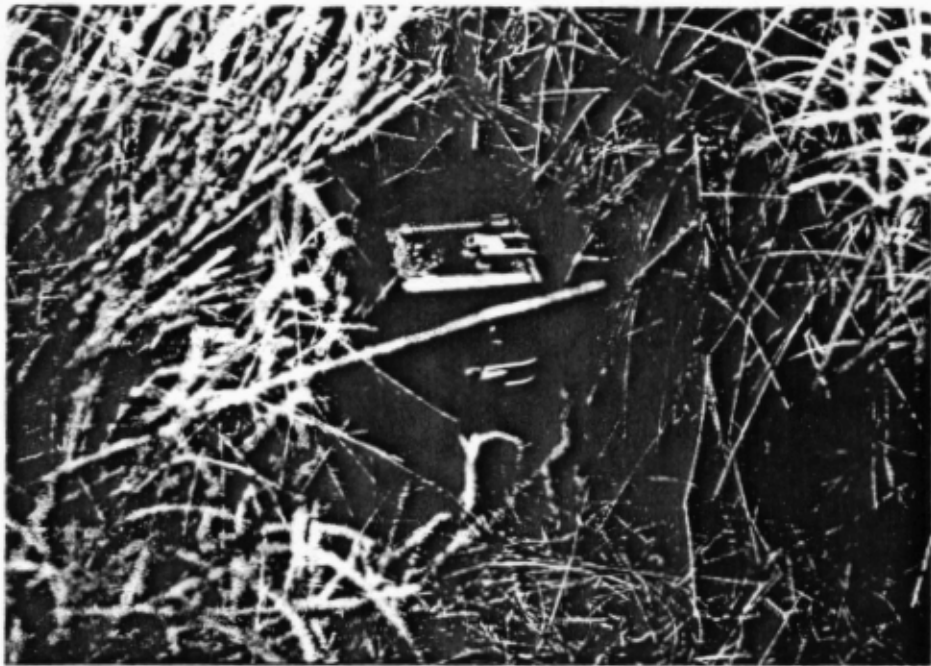


Figure 11b. Infra-red trip beam camera apparatus placed along game trails. Only one of the two boxes is pictured.

Figure 12. Legend for Map of Vegetation Types of Texas (McMahan et al. 1984)

- | | |
|---|--|
| (1) Tobosa-Black Grama Grassland | (27) Live Oak-Ashe Juniper Woods |
| (2) Blue Grama-Buffalograss Grassland | (28) Harvard Shin Oak Brush |
| (3) Bluestem Grassland | (29) Gray Oak-Pinyon Pine-Alligator Juniper Parks/Woods |
| (4) Silver Bluestem-Texas Wintergrass Grassland | (30a) Post Oak Parks/Woods |
| (5) Yucca-Ocotillo Shrub | (30b) Post Oak Woods, Forest and Grassland Mosaic |
| (6) Creosotebush-Tarbrush Shrub | (30c) Post Oak Woods/Forest |
| (7) Creosotebush-Lechugilla Shrub | (31) Willow Oak-Water Oak-Blackgum Forest |
| (8) Creosotebush-Mesquite Shrub | |
| (9) Fourwing Saltbush-Creosotebush Shrub | |
| (10) Ceniza-Blackbrush-Creosotebush Brush | (32) Sandsage-Harvard Shin Oak Brush |
| (11a) Mesquite Shrub/Grassland | (33) Ashe Juniper Parks/Woods |
| (11b) Mesquite Brush | (34) Juniper-Mixed Brush |
| (12a) Mesquite-Lotebush Shrub | (35) Elm-Hackberry Parks/Woods |
| (12b) Mesquite-Lotebush Brush | (36) Water Oak-Elm-Hackberry Forest |
| (13a) Mesquite-Juniper Shrub | (37) Cottonwood-Hackberry-Saltcedar Brush/Woods |
| (13b) Mesquite-Juniper Brush | (38) Pecan-Elm Forest |
| (13c) Mesquite-Juniper-Live Oak Brush | (39) Bald Cypress-Water Tupelo Swamp |
| (14) Mesquite-Sandsage Shrub | (40) Ponderosa Pine-Douglas Fir Parks/Forest |
| (15) Mesquite-Blackbrush Brush | |
| (16) Mesquite-Granjeno Parks | (41) Young Forest/Grassland |
| (17) Mesquite-Granjeno Woods | (42) Pine-Hardwood Forest (Loblolly Pine-Sweetgum) |
| (18) Mesquite-Saltcedar Brush/Woods | (42) Pine-Hardwood Forest (Shortleaf Pine-Post Oak-Southern Red Oak) |
| (19) Mesquite-Hackberry Brush/Woods | (42) Pine-Hardwood Forest (Loblolly Pine-Post Oak) |
| (20) Mesquite-Live Oak-Bluewood Parks | (42) Pine-Hardwood Forest (Longleaf Pine-Sandjack Oak) |
| (21) Harvard Shin Oak-Mesquite Brush | (43) Marsh/Barrier Island (Fresh Marsh) |
| (22) Sandsage-Mesquite Brush | (43) Marsh/Barrier Island (Brackish Marsh) |
| (23) Oak-Mesquite-Juniper Parks/Woods | (43) Marsh/Barrier Island (Saline Marsh) |
| (24) Live Oak-Mesquite Parks | (43) Marsh/Barrier Island (Sea Oats-Seacoast Bluestem Grassland) |
| (25) Live Oak Woods/Parks | (44) Crops |
| (26a) Live Oak-Ashe Juniper Parks | (45) Other Native or Introduced Grasses |
| (26b) Live Oak-Mesquite-Ashe Juniper Parks | |

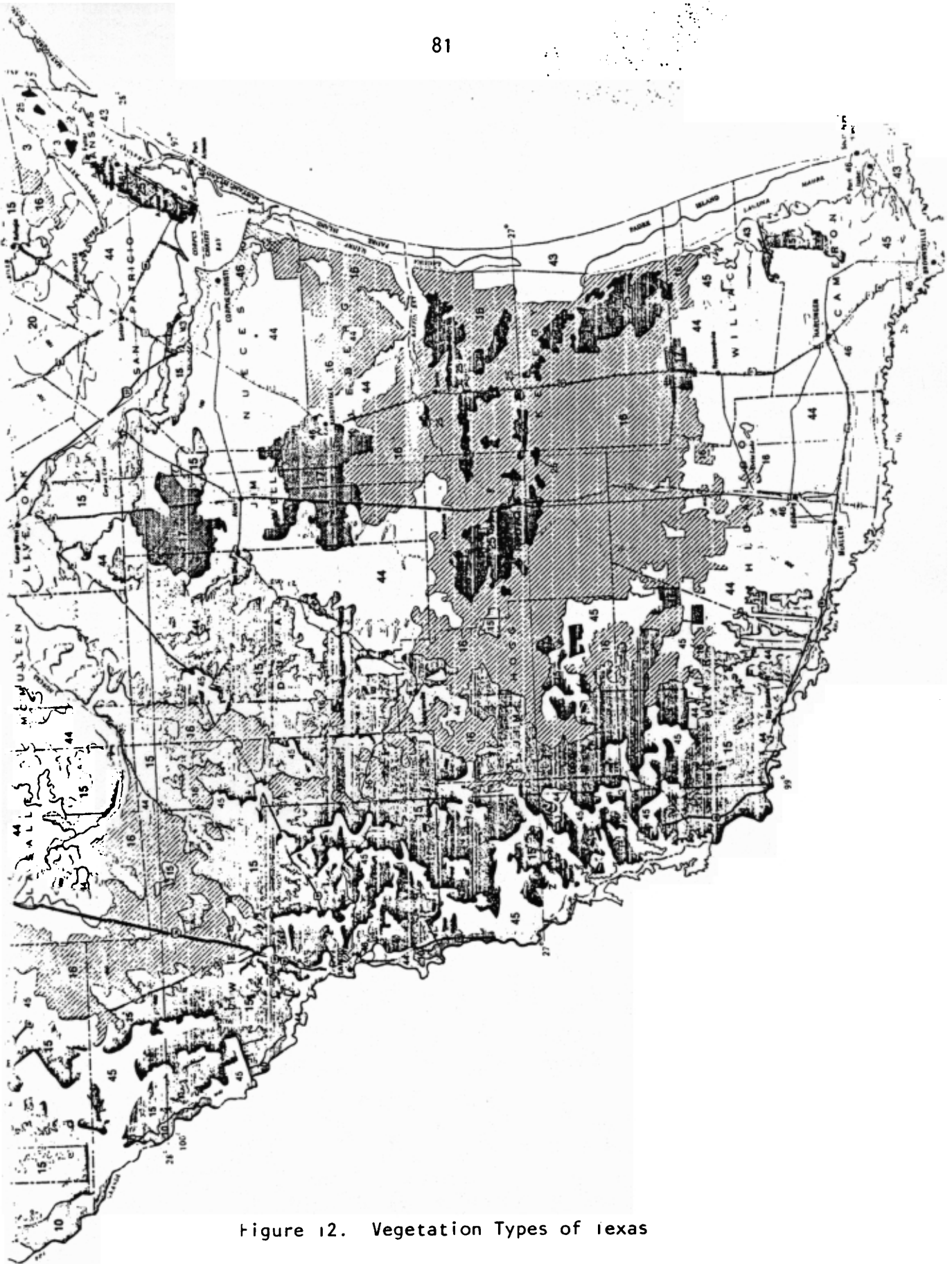


Figure 12. Vegetation Types of Texas

Figure 13. Ocelot habitat aerial survey during summer 1982 of the 13 southernmost counties of Texas. Values expressed in hectares. (Tewes and Everett 1986)

County	Total Acreage	Class A Habitat	Class B Habitat	Total A & B Habitat	A & B Habitat Percent of Country
Duval	469,834	3,193	33,986	37,179	(7.91)
Webb	856,269	1,012	13,189	14,201	(1.69)
Starr	394,593	890	3,857	4,747	(1.20)
Jim Hogg	296,042	-0-	2,359	2,359	(0.80)
Zapata	247,867	*	1,926	1,926	(0.78)
Jim Wells	218,859	81	1,862	1,943	(0.89)
Nueces	134,560	*	1,032	1,032	(0.47)
Brooks	234,140	81	121	202	(0.09)
Kleberg	220,413	*	81	81	(0.04)
Kenedy	361,052	-0-	-0-	-0-	(-0-)
Hidalgo ¹	399,644	1,865	-	1,865	(0.47)
Willacy ¹	153,072	1,781	-	1,781	(1.16)
Cameron ¹	232,068	1,593	-	1,593	(0.69)
Total	4,218,413	10,496(0.25%)	58,413(1.38%)	68,909	(1.63)

* Class A habitat was present along drainages and was not quantified.

¹ Habitat estimates derived for these counties from remote sensing information and ground truthing. Class B habitat was not estimated.

Appendix II - "Land Protection Plan for the Lower Rio Grande Valley
National Wildlife Refuge in Cameron, Hidalgo, Starr, and Willacy Counties,
Texas" (1984), U.S. Fish and Wildlife Service.

Land Protection Plan for Lower Rio Grande Valley National
Wildlife Refuge in Cameron, Hidalgo, Starr, and Willacy
Counties, Texas

Purpose:

This land protection plan (LPP) presents a combination of alternative actions to protect and maintain 10 distinct wildlife communities totaling 107,500 acres which represent the best remaining habitat for certain threatened species on the U.S. side of the Lower Rio Grande Valley (LRGV). More than 115 species of wildlife will benefit, including the white-wing dove, chachalaca; numerous endangered species such as the jaguarundi, ocelot, bald eagle, brown pelican, and peregrine falcon. Permanent protection of these communities will provide an area for the natural occurrence and distribution of those wildlife species and will eliminate the present threat of habitat destruction.

Present trends suggest that the remaining LRGV brushland in private ownership will be developed (destroyed as wildlife habitat) within five years. Some 90 percent has already been lost. Similar habitat on the Mexico side of the river is also being developed rapidly, particularly for agriculture. The Santa Ana National Wildlife Refuge (NWR) established 1942 and Lower Rio Grande Valley National Wildlife Refuge (NWR) established 1979 are considered in this LPP as a single unit.

Ownership Status:

- 15,742 acres - Total lands now administered by United States Fish and Wildlife Service (FWS) in the two refuges
- 10,000 acres - Lands owned by other public/private conservation agencies
- 1,758 acres - Lands held by about 1,000 private landowners, now considered unprotected under some form of permanent basis. The actual ownership of approximately 24,000 acres or 30 percent of the total wildlife community covered in this plan requires quiet title actions by local courts to clear long standing land claims, especially in the Falcon Woodlands area.

107,500 acres - Total

Maps:

Figures 1 and 2 locate the study area in Cameron, Hidalgo, Starr, and Willacy Counties, Texas, and the general location of the wildlife communities and connecting corridors proposed for additional protection in this LPP. Additional maps, aerial photos, a slide program and a Spanish/English brochure are available at the Santa Ana Refuge in Alamo, Texas. Environmental assessments and prior preservation plans and studies of the LRGV are also available at the refuge office for review.

<u>Wildlife Communities</u>	<u>Currently Protected by FWS</u>	<u>Objective</u>	<u>Deficit*</u>
Sabal Palm forest	367 ac.	3,500 ac.	- 3,133 ac.
Lomal/tidal flats	4,600 ac.	10,000 ac.	- 5,400 ac.
Chihuahuan Thorn forest	-0- ac.	24,000 ac.	-24,000 ac.
Upper Valley Flood forest	111 ac.	10,000 ac.	- 9,889 ac.
Barretal	240 ac.	5,000 ac.	- 4,760 ac.
Upland Thorn scrub	-0- ac.	2,000 ac.	- 2,000 ac.
Mid-valley riparian woodland	5,718 ac.	13,000 ac.	- 7,287 ac.
Woodland potholes and basins	4,483 ac.	20,000 ac.	-15,517 ac.
Mid-delta thorn forest	223 ac.	10,000 ac.	- 9,777 ac.
Coastal brushland potholes	-0- ac.	10,000 ac.	-10,000 ac.
TOTAL	15,742 ac.	107,500 ac.	-91,758 ac.

*includes 10,000 acres in public/private conservation ownerships on which lease or management agreements would be negotiated to protect wildlife and approximately 24,000 acres of land with unknown ownership at Falcon Woodlands which will be permanently protected when title has been cleared.

Program Objectives:

The objective is to extend protection to the 96,900 acres of habitat identified in the 10 target wildlife communities and to the species dependent on that habitat; and to enhance conditions on the 10,600 acres already under FWS administration by application of additional management techniques. These would include such actions as (1) impounding water to restore water-based habitats formerly maintained by natural flooding, (2) controlled burning on some areas if research indicates that this would improve wildlife conditions, (3) controlled grazing as a habitat management tool in certain areas, (4) selected reforestation, (5) timber stand management to create and adjust habitats, and (6) accelerated inventories of plant and wildlife using current computerized methods.

Resource Protection Alternatives:

A. No Action: Under this alternative, the brush habitats could be destroyed, probably within 5 years, because landowners can substantially increase their income by conversion to citrus, truck crop production or other types of agricultural uses. There is no financial incentive to permanently preserve the habitat, and there are no laws, regulations, or zoning that could prevent their conversion to other land uses. FWS would rely on management of its presently scattered wildlife unit plus those in public or private ownership. A program of public awareness and education on the wildlife values of these communities will continue, but this would not likely preserve more than a remnant of the remaining habitat.

B. Acquisition or Management By Others: There are approximately 10,000 acres of brush lands now owned by State, County, local governments, or environmental organizations as well as the International Boundary and Water Commission (IBWC). These areas can be adequately protected by various forms of cooperative agreements or no cost mutually advantageous leases. This approach will be pursued to the greatest extent possible; however, census figures show cities in LRGV have the lowest per capita income in the country and most property owners do not have sufficient resources necessary to protect the wildlife populations identified in this plan, without financial assistance.

C. Less-Than-Fee Acquisition: The less-than-fee acquisition alternative has merit and will be used to the maximum extent possible, especially connecting the fee management units along the river and the La Sal Vieja area, but adverse wildlife impacts will continue to occur since: (1) some property owners may not accept easements on their land, especially in perpetuity and for a variety of reasons prefer to sell in fee (2) Government overhead and purchase costs associated with acquiring easements on some of the existing privately owned wildlife units will be higher and less cost effective than direct fee purchase. The easement fee purchase. The easement rights essential for protection of the wildlife communities using the corridors between the fee management units include: (1) development rights, (2) farming, especially to the river bank and shoreline of lakes and ponds, (3) grazing that diminishes brush regeneration, (4) fencing and posting, and (5) hunting rights, if adversely affecting wildlife populations.

D. Fee Acquisition: The fee acquisition alternative offers the optimum to assure future protection or preservation of brushland habitat, but adverse wildlife impacts will likely occur because: (1) based on past budget levels, it is highly unlikely FWS will receive sufficient acquisition funding in time to preserve all of the wildlife habitat identified in this plan; and (2) some landowners will never willingly sell their brushland property to anyone and elect to clear the land for agricultural or other economic purposes.

E. Combination: The use of a combination of all alternatives to the maximum extent possible offers the best opportunity to assure future protection of the wildlife communities identified in this plan. The key will depend on public acceptance and future funding available for protection of this land use by wildlife.

Coordination:

FWS activities have been closely coordinated with the Texas Parks and Wildlife Department (TPWD), and IBWC, plus local public agencies and chapters of conservation groups. Some 500 landowners have been contacted over the past 10 years on protection of wildlife in LRGV. The TPWD and other private conservation agencies

also have contacted many landowners. The overall attitude has been strongly supportive. Preferences have been expressed for reserving mineral rights in private ownership and for freedom of choice in decisions to sell (or not to sell land). The public is also aware of the substantial inflow of hunters' expenditures to the local economy. Copies of this LPP will be distributed to landowners, local, and State government agencies and other interested parties.

Summary of Proposed Action by Protection Alternative:

Resource Protection Alternative	Proposed Action
A. No Action (Land Acquisition)	Update joint FWS-TPWD Spanish-English brochure and accelerate use of short 8-10 minute slide-tape program to educate the public about the need to protect wildlife resources on private land. Increase wildlife technical and Realty assistance to landowners throughout the LRGV by establishing a Realty Specialist and Forester position at the Refuge.
B. Acquisition/Management by Others	Continue close cooperative joint preservation effort with TPWD. Increase Realty technical assistance to State through Federal Aid and other programs. Develop cooperative agreement and implement joint plan with IBWC covering purchase of restrictive development easements along wildlife river corridor that complement IBWC and FWS agencies' program needs (if possible use a single U.S. easement document that may be used by both agencies). Encourage environmental organizations to accelerate protection of private lands, through donations, deed restrictions, or purchase of additional brushlands. Accelerate work with local, public agencies in developing agreements, licenses, leases, and other cooperative arrangements to protect wildlife habitat on their lands.
C. Less-Than-Fee Acquisition	Initiate major effort to acquire conservation easements with minimum managements rights needed to establish wildlife corridor along river (at least 100 meters back from Rio Grande) and connect existing FWS, State and private preserves.

D. Fee Acquisition

Accelerate effort to round out or complete purchase of current public and private management units from list of willing sellers along river and in Tres Corrales-La Sal Vieja area. Strengthen future budget submittals to Central Office as appropriate to clarify need for stable increased funding source during next 5-year critical period.

E. Summary of Proposed Action by Combination Approach
for each Wildlife Community

Priority	10 Wildlife Communities	Tracts	Permanently Unprotected Acres	Method of Protection	Remarks
Group I	Riparian wood-lands (river corridor)				
	Chihuahuan thorn forest	600	24,000	No land acquisition until ownership determined	Work with county officials to clear title problems. Contact residents claiming land to encourage protection of brushlands until land title can be cleared through courts and ownership determined.
	Sabal Palm Forest	5	3,133	Fee title	Complete fee acquisition between Federal management unit and Audubon Sanctuary. Protect Sabal Palm forest from further destruction by burning of young palms that is now being done.
	Upper Valley flood forest	95	899	Lease or agreement	Complete acquisition of 8 FWS scattered management units. Post and protect brush from further clearing and connect fee areas along river by 100 meter easement
			3,000	easement	Negotiate agreement with IBWC to protect river bank.
			6,000	fee	
			<u>9,889</u>		

E. Continued

Priority	10 Wildlife Communities	Tracts	Permanently Unprotected Acres	Method of Protection	Remarks
	Mid-valley riparian woodland	90	847 2,000 <u>5,000</u> 7,847	Lease or agreement easement fee	Complete acquisition of 5 FWS scattered management units. Post and protect brush from further clearing and connect fee areas along river by 100 meter easements. Negotiate agreement with IBWC to protect river bank.
Group II	Interior thorn woodlands				
	Barretal (forest)	50	3,000 <u>1,760</u> 4,760	Fee easement	Complete acquisition of 5 FWS scattered management units. Post and protect brush from further clearing and connect fee areas with river corridor or other State park or brush areas by easement.
	Upland thorn scrub	20	1,000 <u>1,000</u> 2,000	Fee easement	
	Mid-delta thorn forest	70	3,000 <u>6,871</u> 9,871	Fee easement	

E. Continued

Priority	10 Wildlife Communities	Tracts	Permanently Unprotected Acres	Method of Protection	Remarks
Group III	Interior wetlands (Salt lakes and brush)				
	Woodland potholes and basins	40	10,000 <u>10,000</u> 20,000	Fee easement	Complete acquisi- tion of 2 FWS management units. Post and protect brush from further clearing and connect fee areas between brush and salt lakes by use of easements.
Group IV	Coastal Wetlands				
	Lomal/Tidal flats	5	5,000 400 <u>5,400</u>	Lease or agreement fee	Complete acquisi- tion of Loma FWS management unit. Post and protect brushlands and coastal wetlands. Negotiate agree- ment with Brownsville navigation district and State to protect remaining wetlands.
	Coastal brushland/ potholes	25	2,000 5,000 <u>3,000</u> 10,000	Lease or agreement easement fee	Establish 2 fee management units. Post and protect brush and potholes Connect fee areas with easements. Negotiate agree- ment with State to protect remaining wet- lands.

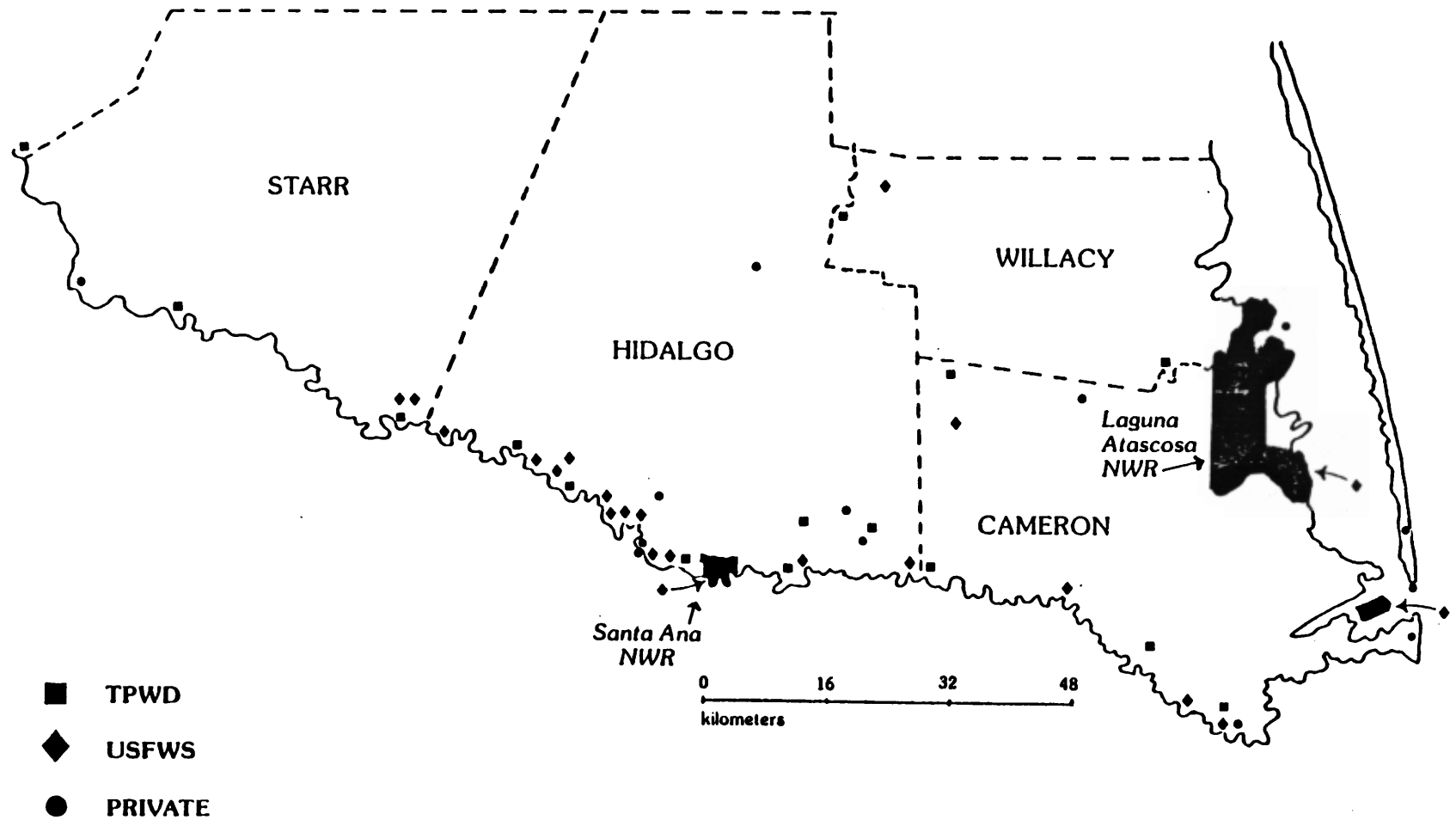
E. Continued

TOTALS 10 Wildlife	1,000	34,533	Fee
Areas	tracts	29,631	easement
		8,736	lease or agreement
		24,000	determine ownership
		<u>96,900</u>	

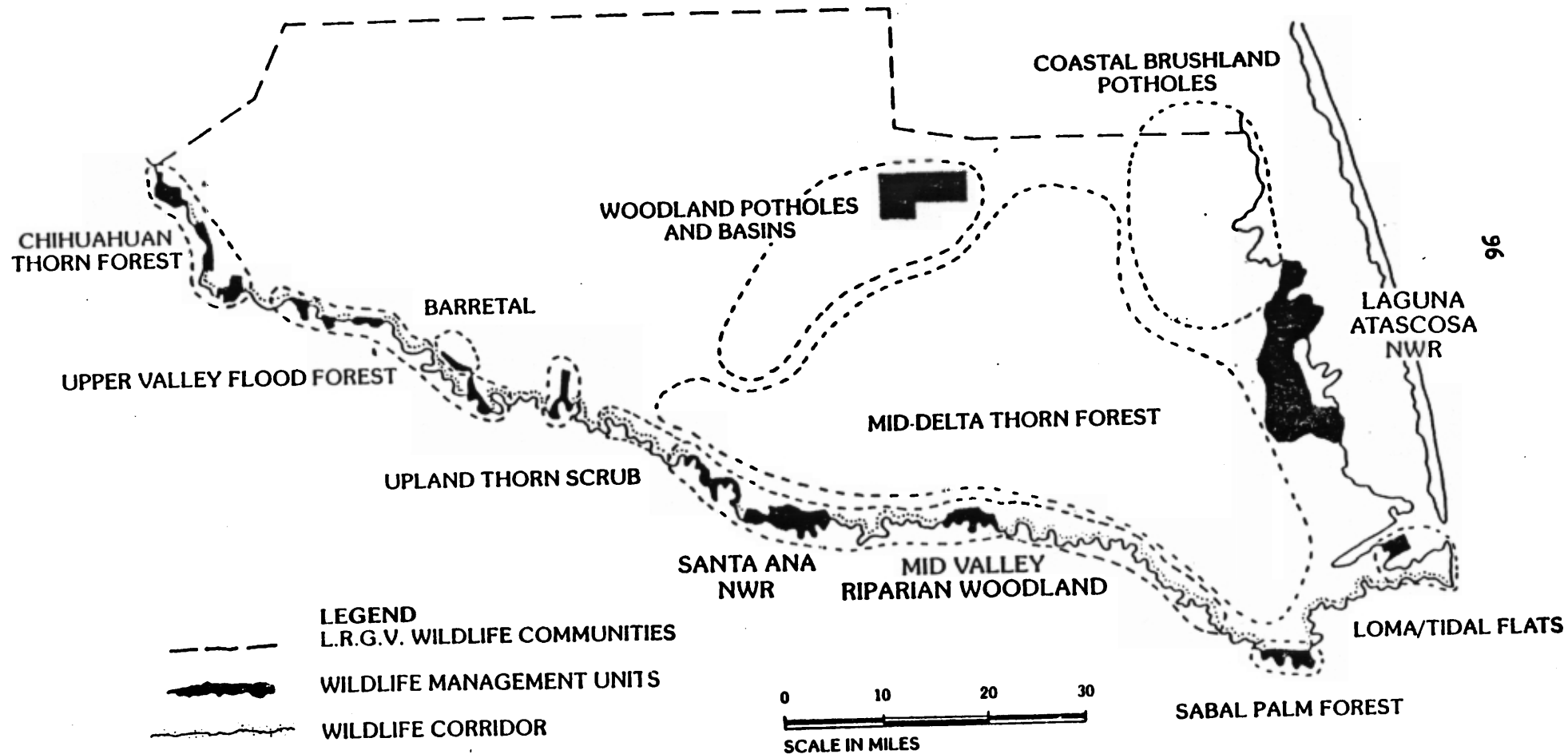
RIO GRANDE VALLEY



EXISTING PARKS, REFUGES, SANCTUARIES, AND WILDLIFE MANAGEMENT AREAS



RIO GRANDE VALLEY NATIONAL WILDLIFE REFUGE LAND PROTECTION PLAN



Appendix III - Status of other Neotropical Felids in the United States

STATUS OF OTHER NEOTROPICAL FELIDS

In addition to the ocelot, three other neotropical felids have been reported in the United States: the jaguar, Felis (Panthera) onca; the margay Felis (Leopardus) weidii; and the jaguarundi, Felis (Herpailurus) vagouarundi.

The margay resembles a small, long-tailed ocelot. Its distribution is similar to the ocelot's in Central and South America (Hall 1981). However, the northern extent of its range is not nearly as extensive. The only U.S. specimen is from Eagle Pass, Texas, and was collected by Colonel S. Cooper, U.S. Army in 1852 (Goldman 1943). No other margays have been collected north of central Tamaulipas on the east side of Mexico, and west central Chihuahua on the west side (Hall 1981). The margay may no longer occur in or near the United States. No recovery recommendations will be made.

The jaguar is the largest of the American spotted cats. Its status in the southwestern United States has been reviewed by Brown (1983). Jaguars have been recorded from Texas (Taylor 1947, Nelson and Goldman 1933), California (Leopold 1959, Hock 1955), New Mexico (Halloran 1946, Hill 1942, Baily 1931), and, most commonly, Arizona (Brown 1983, Hoffmeister 1971, Lange 1960, Hock 1955, Nelson and Goldman 1933, Goldman 1932, Shuffeldt 1921). There have been unconfirmed reports from the southeastern

United States in the late 1800's (Nowak 1973). The last documented record in the U.S. is from Nogales, Arizona, in 1971 (Brown 1983). However, a male jaguar was reported shot in the Dragoon Mountains of Cochise County, Arizona in December, 1986. Bailey (1931) considered jaguars "native" to Arizona and New Mexico. Brown (1983) cites at least 58 reliable records of jaguars in Arizona and New Mexico since 1900. These records include a female with young (Lange 1960) and records of more than one animal at a time (Shuffeldt 1921). Brown (1983) concludes that jaguars were a recent resident of Arizona, and that their gradual decline was concurrent with the predator control measures implemented during settlement of Arizona and the development of the cattle industry. Most of the Arizona jaguars were taken in Madrean evergreen woodland, shrub-invaded semi-desert grassland, and river bottoms. Since the 1960s, the jaguars in Arizona have probably been "wanderers" from Mexico. Brown (1983) cites personal communications that jaguars were being taken by ranchers in northern Sonora in the 1960s, and that they are still considered extant today in the Sierra Bacatete near Guaymas, Sonora. Before recovery recommendations can be made for the jaguar, its status in northern Mexico has to be determined. There is evidence to warrant further investigation of the jaguar as a target species for recovery in the Southwest.

The jagundi is a long slender cat, a little larger than a house cat but much longer. It has a solid grey or reddish-brown coat. Its distribution is similar to the ocelot's (Hall 1981); and, similar to the ocelot, it inhabits dense thickets (Tewes and Everett 1982, Davis 1974, Leopold 1959). It has been recorded from both Arizona (Little 1938) and

Texas (Davis 1974). Because of its secretive nature, its status and natural history are not well known (Goodwin 1970). Bailey (1905) lists six jaguarundis added to the Biological Survey collection in 1891 and 1892. Five were from the Brownsville area of Texas, and one from Lloyd. Tewes (pers. comm. 1987) has seen a photograph of two live jaguarundis that had been trapped in Willacy County, Texas, in 1969. A road-killed specimen was recovered in Cameron County, Texas, on April 21, 1986. There have been many unconfirmed recent sightings of jaguarundis in Texas (Tewes and Everett 1986) and a few from Arizona. The jaguarundi is suffering from the loss of the same habitat as the ocelot in Texas (Davis 1966, Tewes and Everett 1986) and would benefit from the same habitat preservation and enhancement as for the ocelot recovery. Recovery recommendations are to continue trapping and photo-documentation efforts in Texas to determine its status and distribution. If trapped, telemetry studies should be implemented to determine activity patterns and habitat use. In Arizona, a hunter/trapper survey could provide insight into possible jaguarundi distribution in Arizona.

At least one and possibly more jaguarundis have been released by individuals to the wild in the Lower Rio Grande Valley of Texas. These releases could account for at least a portion of the sightings reported in some areas. It is also possible that captive, pet ocelots and/or margays could have been released in the past in south Texas.

Appendix IV - Agency Draft (1987) - List of Reviewers, Comments,
and Service's Responses

An agency draft of the Listed Cats of Texas and Arizona Recovery Plan was sent out for review on March 12, 13, and 19, 1987, and comments were received from the following:

Ecological Services, Corpus Christi, Texas (USFWS)
Ecological Services, Phoenix, Arizona (USFWS)
Refuge Supervisor, Arizona/New Mexico (USFWS)
Refuge Manager, Laguna Atascosa National Wildlife Refuge
National Wildlife Health Center
National Ecology Center (USFWS)
Arizona Cooperative Fish and Wildlife Research Unit (USFWS)
Bureau of Land Management, Arizona State Office
Arizona Game and Fish Department
Mike Tewes, Caesar Kleberg Wildlife Research Institute
Peter Siminski, Arizona-Sonora Desert Museum
Howard Quigley, Wildlife Research Institute, Moscow, Idaho

Letters of comment have been reproduced in this section and are followed by the Service's responses.

A-7

Additionally, greater emphasis is needed specifically on the jaguarundi. Intensive research is needed to determine how to capture and study this animal.

We cannot manage and conserve this species without knowing what its basic life requirements are.

We appreciate the opportunity to comment on the draft recovery plan. If you have any questions, please call us at 529-3346.

Thomas E. Stahl



103
UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
ECOLOGICAL SERVICES
3616 W. Thomas, Suite 6
Phoenix, Arizona 85019

March 27, 1987

Memorandum

To: Regional Director, FWS, Albuquerque, NM (FWE)

From: Field Supervisor

Subject: Review of Agency Draft Recovery Plan for Listed Cats of Arizona and Texas

We have reviewed the subject draft and find that the actions called for therein will adequately address the current status and needs of the ocelot and jaguarundi in Arizona.

Thank you for the opportunity to comment on the draft recovery plan. If we may be of further assistance, please contact Ms. Lesley Fitzpatrick or me (Telephone: 602/261/4720).

Sam Feller

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Mr. Callahan	
Mr. Conrad	
Mr. Felt	
Mr. Gale	
Mr. Rosen	
Mr. Sullivan	
Mr. Tavel	
Mr. Trotter	
Tele. Room	
Mr. Holmes	
Miss Gandy	

In Reply Refer To:
Region 2: RF

To: Chief, Endangered Species Office, Region 2

From: Refuge Supervisor, AZ/NM

Subject: Agency Draft Recovery Plan for the Listed Cats of Arizona and Texas

C-1 We have reviewed the subject plan with respect to national wildlife refuges in Arizona and find it an adequate assessment of the status and recovery potential of the listed felids in that state.

Other than the specific typographical errors discussed with Ms. Shull of your staff, we recommend no changes be made to the plan.

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MAR 30 '67

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DATE: April 13, 1987

SUBJECT: Comments on Recovery Plan for Listed Cats

[illegible]

Ray Rauch
Ray Rauch

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RECOVERY PLAN FOR LISTED CATS COMMENTS

- D-1 p. 14 Eight ocelots (6-Laguna Atascosa NWR, 1-Santa Ana NWR, and 1-Willacy County) have been recovered and six of the deaths appear attributable to motor vehicle injuries.
- D-2 p. 17 Laguna NWR probably supports 25 to 30 ocelots not 10 to 15.
- D-3 20,000 hectares in a single block or contiguous blocks should support about 150 ocelots.
- D-4 p. 20 The majority of the farm fields (1,100 acres) on Laguna NWR are on soils that do not produce high quality brush as explained on p. 18. Some farm fields that are located on the best soils to produce quality brush have been removed from farming, and the orderly phase out of farming on these soil types is planned and coordinated with the cooperative farmer.
- D-5 p. 21 Why is there a push to acquire ocelot habitat only along the Rio Grande in the Rio Grande Valley? Laguna Atascosa NWR has the largest known population of ocelots in the U.S. It would seem that there should be an equal effort to obtain areas contiguous with the Laguna Atascosa NWR or the known corridors ocelots are now using, including those along which the ocelots are getting killed crossing roads as they look for suitable habitat.
- D-6 p. 32 I. 49,400 acres in a single block or contiguous blocks connected by travel corridors should support about 150 ocelots.
- D-7 p. 33 12. assess possible contaminant problems in ocelots. A road-killed ocelot's liver showed .71 ppm Selenium recently.
- D-8 p. 39 1233. Assess possible contaminant problems in ocelots. A road-killed ocelot's liver showed .71 ppm Selenium recently.
- D-9 p. 40 131. Why is there a push to acquire ocelot habitat only along the Rio Grande in the Rio Grande Valley? Laguna Atascosa NWR has the largest known population of ocelots in the U.S. It would seem that there should be an equal effort to obtain areas contiguous with the Laguna Atascosa NWR or the known corridors ocelots are now using, including those along which the ocelots are getting killed crossing roads as they look for suitable habitat.

p. 41 132. Agree to a point. Laguna Atascosa NWR was purchased with Duck Stamp funds and established as a wintering waterfowl refuge. Both endangered species and waterfowl have to be managed for at this refuge. Certain farm fields can, and have been, removed to be put into brush. This depends upon soil types to grow quality brush for ocelot habitat. On the other hand, this refuge and the FWS has an obligation to manage this refuge for its original intended purpose, waterfowl. This dual management effort can be successful, if it is approached correctly and phased in over a period of years.

D-10

p. 43 143. Some words or sentences seem to be missing between p. 42 and 43.

D-11

p. 43 15. Very Good.

D-12

p. 44 23. This should be a high priority research item and undertaken as soon as possible.

D-13

p. 74 2. Ocelots captured at Laguna Atascosa NWR as of 3/01/87 total 23 cats.

D-14

p. 89 Laguna Atascosa NWR is not included or even mentioned in the LPP for LRGV NWR in Cameron, Hidalgo, Starr and Willacy Counties. All the endangered species listed in the LPP occur more frequently and in larger numbers at Laguna Refuge than either Santa Ana or LRGV NWRs. This would seem to at least warrant inclusion or mention of Laguna Atascosa Refuge in this plan, especially if it is to become part of the Ocelot Recovery Plan.

D-15

Message 192-105

Subj: Listed Cats of Arizona and Texas

Director, National Wildlife Health Center (NWHC), Madison, WI

Review of Agency Draft Recovery Plan -- Listed Cats of Arizona and Texas

Assistant Regional Director (AFF), Region 2

E-1 I appreciated the opportunity to review the subject document. This is one of the few documents of this type that I have seen in which disease is given consideration. Obviously, I am pleased with this recognition. However, I have some concern regarding the rather restrictive focus of disease evaluations described and ability to interpret the significance of survey work without supportive research.

We would be happy to pursue this aspect of the Draft Recovery Plan further with Dr. Harwell or others. Dr. Nancy Thomas is our Center contact regarding endangered species. She can be contacted directly rather than going through me.

/s/ Milton Friend

MF/cd

cc: SE Disease Specialist, NWHC
Research Branch Chief, NWHC
Staff Specialist, SE, WCR

R3NWHC for R2AFF 11:04 MDT 28-Apr-87 Message 192-105 [1]

[Done]

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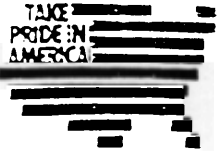
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109
United States Department of the Interior

FISH AND WILDLIFE SERVICE

National Museum of Natural History
Washington, D.C. 20560
(202) 357-1930



23 April 1987

Memorandum

To: Assistant Regional Director (AFF), Region 2

From: Alfred L. Gardner, Wildlife Biologist *Alfred L. Gardner*
Biological Survey, NEC

Subject: Review of Agency Draft Recovery Plan--Listed Cats of Arizona
and Texas

I have reviewed the draft recovery plan and agree with its basic tenants and approach. However, I strongly recommend that the draft be subjected to rigorous editing before it is submitted in its final form.

F-1

Except for Appendix II, I found the wording and sentence structure unnecessarily stuffy, cumbersome, redundant, and potentially misleading. In my opinion, recovery plans should be written in crisp, straight-forward, and easy to understand prose free from jargon. This characteristic is essential considering the potentially sensitive nature of such recovery plans. I have provided some comments, questions, and suggested revisions on the draft copy of the recovery plan. However, my "editorial" comments are by no means complete for the entire manuscript.

ARIZONA COOPERATIVE FISH AND WILDLIFE RESEARCH UNIT

UNIVERSITY OF ARIZONA
ARIZONA GAME AND FISH DEPARTMENT
U.S. FISH & WILDLIFE SERVICE
WILDLIFE MANAGEMENT INSTITUTE

210 BIOLOGICAL SCIENCES EAST
UNIVERSITY OF ARIZONA
TUCSON, ARIZONA 85721

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MEMORANDUM

TO: Assistant Regional Director, Region 2
FROM: Assistant Unit Leader Arizona CFWRU
SUBJECT: Draft Recovery Plan for Listed Cats in Arizona and Texas

Obviously little is known about the cats discussed. The available information is so limited that extrapolation to areas beyond where the data were collected is scientifically unjustified. The information derived from the Tewes study is difficult for me to evaluate because the references are not readily available (especially in the less than two weeks I was given) and the descriptions of his sampling procedures are sketchy. However, because the Tewes data is the only data it is also the best data.

From the information given in the draft, classification of "optimal habitat classes" leaves much room for improvement. Even though the validity of the "habitat classes" may be questioned from a practical view, it may be adequate and not jeopardize the ocelot plan in Texas.

The majority of the actions outlined in the step-down procedures are laudable and are probably not detrimental. Possible exceptions include:

1. translocation of captive stock
2. augmentation of existing stock
3. extensive trapping and radio tracking of small populations

G-1 We should know what factors eliminated previous populations and what factors are limiting extant populations before we add individuals to those areas. We may not only lose the translocated individuals but also may interfere with those few present.

G-2 Capturing and radio-tagging animals from precarious populations presents a dilemma. We need the information we can get only from radio-tagged animals but we risk mortality and interference with the behavior of the few wild successful individuals we have. The loss of only one litter may be a severe set-back for these small populations.

G-3 If it is possible, and if populations in Mexico are less precarious, some basic information could be gathered there. I realize that this suggestion may not be practical for political reasons.

G-4 The emphasis on gathering information is well placed and while getting this information, preserving habitat adjacent to occupied habitat should have high priority.

G-5 It is unfortunate that I did not have more time to spend on this document but I received it about 10 days prior to the deadline for comment. The copy I got was thoroughly scrambled after page 40. It was copied on both sides of the paper and improperly collated, i.e., page numbers went 40, 43, 41, 45, 44, 47, 49, 46, 51, etc. It was impossible for me to concentrate on a paper like that.

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APR 16 1987

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AFF

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
ARIZONA STATE OFFICE

6840 (932)
1398G

MEMORANDUM

Date: April 23, 1987

To: Regional Director, U.S. Fish & Wildlife Service
Albuquerque, New Mexico

From: State Director, Arizona

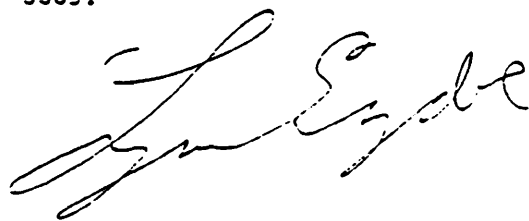
Subject: Comments on Recovery Plan for Listed Cats

We have reviewed the agency Draft Recovery Plan for Listed Cats of Arizona and Texas and have the following comments.

With reference to Step M3 of the Implementation Schedule, pages 64 and 65, we consider the protection of existing and potential habitat as including retention in Federal ownership. Since neither type of habitat has been identified in Arizona, we would be unable to retain specific sites at this time.

Within the range of the ocelot in Arizona, we are identifying areas for disposal, retention and acquisition. These actions will be undertaken in the Resource Management Plans (RMP) now being developed. The ocelot has not been a factor in these plans as the U.S. Fish and Wildlife Service (FWS) and the Arizona Game and Fish Department have not identified a need for its consideration within the planning areas. The proposed action in the Phoenix Resource Area RMP includes retention of existing Federal lands and acquisition of other lands in the vicinity of the Baboquivari Mountains near Sasabe. An ocelot was reported from the Sasabe area, according to the Draft Recovery Plan (page 8). Most scattered tracts of Federal land in the Phoenix planning area of southern Arizona would not be retained in Federal ownership. If known habitat was identified, we would work toward management of those lands for endangered species. Should ocelot habitat be identified in the future, we would consider the new information in the next planning cycle, or when our plans needed revision or amendment.

We appreciate the opportunity to comment on this plan. If you have questions, contact Gene Dahlem at FTS 261-5509.



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April 8, 1987

Jack B. Woody
 Acting Assistant Regional Director
 U.S. Fish and Wildlife Service
 Post Office Box 1306
 Albuquerque, New Mexico 87103

Dear Jack:

Thank you for the opportunity to review the "agency draft" of the Recovery Plan for the Listed Cats of Arizona and Texas. We were quite pleased to see how substantially the plan had been revised by incorporation of our comments of 30 October 1985 on the technical draft.

During our review of this draft, editorial remarks were made on the document itself. The original is included with this letter for your use. A copy was also sent to the junior author of the plan. Overall, the plan was remarkably free of typographic errors.

The plan as presently structured is clear and well structured. We strongly concur with the objectives and implementation strategies. We have only two concerns.

1. The implementation budget for Arizona-Sonora seems unrealistically low, especially if the USFWS dollar figures include all work that would likely be contracted out. The basic monitoring and survey efforts alone required for substantive progress will likely cost three to four times the amount budgeted. As the Service has found in Texas, investigations of this nature are very labor, time and equipment intensive. Logistical considerations are even greater for Arizona-Sonora than for Texas.
2. The plan does not address sport or commercial trapping specifically. Clearly there are potential and perceived conflicts between trapping and ocelot-jaguarundi conservation. The plan should be revised to state what such conflicts are, how or if they can or should be mitigated, and the possibility of use of experimental population designations for reintroductions of ocelot-jaguarundi in Arizona (and elsewhere).

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April 8, 1987

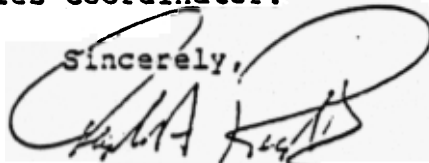
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Further, it is our belief that leg-hold trapping as presently practiced in Arizona need not be perceived as at conflict with conservation of either ocelot or jaguarundi, but as a potentially valuable tool. Since trap-lines must be run at least once each 24 hours, perhaps trappers could be requested to contact AGFD wildlife managers when either species is inadvertently trapped. If there were no legal liability for the trapper in such instances, we might make substantial progress in understanding the two species status in Arizona and at much reduced financial outlays.

In any event, the plan should be modified to consider trapping and to state clearly how its relationship to the objectives of the plan is perceived by the Service. We note that this request was also made in our previous comments on the plan, but no response was made in the plan or separately by the Service.

If the Department can be of any assistance in revising the plan to accommodate our concerns, please contact me or Terry B. Johnson, our Endangered Species Coordinator.

Sincerely,



Temple A. Reynolds
Director

TAR:TSJ:rp

cc: Terry Johnson
Tom Spalding
Dave Brown

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CAESAR KLEBERG

WILDLIFE RESEARCH INSTITUTE

Texas A&I University • Campus Box 218 • Kingsville, Texas 78363 • 512/595-3922

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April 21, 1987

Mr. Michael J. Spear
Regional Director
U.S. Fish and Wildlife Service
P.O. Box 1306
Albuquerque, NM 87103

Dear Mike:

Greetings! As you may have heard, upon completion of my Ph.D. in Idaho last August, I returned to Texas to continue work on the ocelot and jaguarundi. The conservation of these cats represents both a professional and personal goal. Hopefully, I will be able to contribute in a meaningful way toward this goal.

In fact, the Caesar Kleberg Wildlife Research Institute of Texas A&I University and the National Wildlife Federation have recently established the Feline Research Program here in South Texas. Our overall goal is to focus on the research and conservation needs of the wild cats, with emphasis on the ocelot and jaguarundi. Maybe sometime in the near future I will be able to discuss our more specific goals and objectives with you.

J-1

Enclosed are my comments on the agency draft of the Recovery Plan for the Listed Cats of Arizona and Texas. I appreciate the opportunity to examine this document. If you or your staff have any questions regarding the interpretation of my comments, then please feel free to contact me.

Best regards,

Mike

Dr. Michael E. Tewes
Assistant Research Scientist

MET/bl

Enclosure

MAY 5 1987

Aff

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Mr. Conrad A. Fjetland
Asst. Regional Director, Region 2
U.S. Fish and Wildlife Service
P.O. Box 1306
Albuquerque, New Mexico 87103

28 April 1987

Dear Mr. Fjetland,

I am writing to supply comment on the Draft Recovery Plan of Listed Cats of Arizona and Texas by Harwell, Siminski, and Carley. I note that the comment period for the draft was to close 24 April. However, I only yesterday received a copy through the Coop Unit here. In my quick review of the draft, I believe I have found a few points which should be considered before the final recovery plan is formulated.

First, let me say that the plan is very well put together and researched. The authors did a commendable job and the species addressed will benefit from the implementation of such a plan.

Second, the reason I feel compelled to comment is I have a certain amount of knowledge about the felids of concern here since I (along with Peter Crawshaw) conducted 3 years of research on jaguars and ocelots in Brazil. As such, I have a feel for the ecology of these species and know the available and soon-to-be-released literature on them.

It concerns me that there is no mention in the Ocelot recovery plan of potential conflicts between humans and ocelots, except in terms of habitat loss. Habitat preservation is without a doubt the most critical factor. However, in almost every country in which it occurs, the ocelot is cited as a predator of domestic fowl. This may not be a problem in south Texas at this time, but it is a potential problem at least. I suspect that on the Mexican side it is more common. It is my experience that ocelot depredations took place where poor husbandry practices were in place. In all cases where depredations took place, the ocelot was killed. However, with some minor adjustments ocelot problems were eliminated and, in fact, they can live in close proximity to domestic fowl without any conflicts.

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I think that a more aggressive move in the recovery of ocelots needs to be at least given some consideration since it may be applicable in some situations. The Draft lists the bobcat as both a predator of, and a competitor with, the ocelot (p.16). In the proposed research, why not experiment with a brief removal of bobcats from small areas and monitor the response (if any) in the ocelot population. It's highly unlikely that this would have a negative effect on ocelots in the removal area.

In addition, those bobcats which are removed could be used in relocation experiments. The results of such relocations could provide valuable information which later could help in the proposed ocelot relocations to suitable habitat.

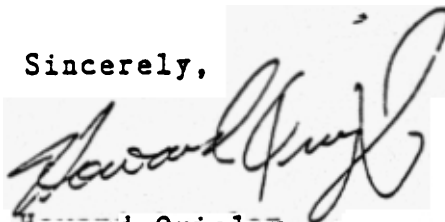
A few short notes:

L-4 * Though the draft refers to the jaguar as Panthera onca in the Introduction (p.1), Felis onca is used in the Appendix (p.102). I think you'll find that Panthera is the most accepted scientific name and the one that is used by the Federal Register.

L-5 * The statement that the margay is rare throughout its range (p.102) is simply not true. Fair populations of the cat occur in both Brazil and Peru, though Leopold may not have found that to be the case in Mexico.

I hope my comments have been of some help. Again, congratulations to your people on a job well done.

Sincerely,



Howard Quigley

cc: B.Sparrowe, USFWS

Responses to Comments

- A-1 Corrections made.
- A-2 Correction made.
- A-3 Correction made.
- A-4 Comment incorporated.
- A-5 Comment incorporated as steps 125. and 325. of the step-down outline.
- A-6 The cost estimates in Part III - Implementation Schedule include estimates for contracted work, but not land aquisition. Cost estimates have been increased for some tasks.
- A-7 Comment partially incorporated by addition of step 311. in step-down outline.
- B-1 Comment noted.
- C-1 Comment noted.
- D-1 Comment incorporated.
- D-2 Change made.
- D-3 Because the home ranges of ocelots on Laguna Atascosa NWR contain more than thorn forest and because the thorn forest on Laguna is not continuous, it is not feasible to extrapolate from the current data to an estimate of ocelots that 20,000 ha of continuous thorn forest could support. Therefore, this reference to such an estimate has been deleted.
- D-4 Comment incorporated.
- D-5 Comment is addressed under steps 132. and 141.
- D-6 See response to D-3.
- D-7 Comment incorporated as step 125.
- D-8 Comment incorporated as step 125.
- D-9 See response to D-5.
- D-10 Comment noted.
- D-11 Correction made.
- D-12 Comment noted.

- D-13 Comment noted.
- D-14 This specific information has been deleted from the plan and replaced with more general information because the specific information is quickly outdated.
- D-15 This office (Endangered Species) did not write and is not responsible for the Land Protection Plan for the Lower Rio Grande Valley National Wildlife Refuge. However, protection of habitat in and around Laguna Atascosa NWR has been included in the Listed Cats Recovery Plan.
- E-1 Comments incorporated after phone conversation with Dr. Nancy Thomas.
- F-1 Comments noted and incorporated where appropriate.
- G-1 Translocation is intended for individuals that have been identified as likely dispersers. The largest known cause of mortality of ocelots is cats being hit while crossing the road dispersing from Laguna Atascosa NWR. These dispersers, which will likely be lost anyway, would be translocated to areas that appear suitable for ocelots, but do not currently contain ocelots. This information has been added to the narrative to clarify these points.
- G-2 The Office of Endangered Species has funded research for 7 years that includes radio-tagging of ocelots. Not one ocelot has died from this procedure and much valuable data on this species has been obtained. The Office of Endangered Species believes the risks of radio-tagging are worth the information gained in this case.
- G-3 The ocelot's status in Mexico is unknown; the assessment of its status there is included in the recovery plan.
- G-4 Comment noted.
- G-5 We are sorry that a mix-up occurred in the pages of your document and that it was delayed getting to you. Because you were not on our mailing list, we assume you got your copy from the Fish and Wildlife Service Division of Research in Washington, D.C., which would explain the delay (as we mailed the documents out over a month before the comments were due) and the mix-up in pages (as it would be easy to do if they photocopied their document, which was front and back copied, onto front and back copies for you).
- H-1 Comment noted.
- H-2 Comment noted.
- I-1 Comment incorporated.

Appendix V - Final Draft (1989) - List of Reviewers, Comments,
and Service's Responses.

Comments and new data were incorporated into the final draft that was made available for public review in 1989. The final draft was sent out for review upon request to the following:

Alan Shoemaker, Riverbanks Zoological Park

Robert Schumacher, Refuge Manager, Lower Rio Grande Valley NWR

Ned Meister, Texas Farm Bureau, Waco, Texas

Cindy Fain, Committee for Humane Legislation, Washington, D.C.

Mike Messmer, Sierra Club, Harlingen, Texas

Harold Burgess, Frontera Audubon Society

Rose Farmer, Sabal Palm Grove Sanctuary

Doug Ekland, International Boundary and Water Commission

Mary Lou Campbell, Sierra Club, South Padre Island

Dr. Mike Tewes, Caesar Kleberg Wildlife Research Institute

Linda Laack, Caesar Kleberg Wildlife Research Institute

Ray Rauch, Region 6, U.S. Fish and Wildlife Service

The Humane Society of the United States, Washington, D.C.

Ecological Services, Phoenix, Arizona (USFWS)

Ecological Services, Corpus Christi, Texas (USFWS)

Joe Ann Fanelli, The Wilderness Society, Washington, D.C.

An announcement for a 30-day public comment period was placed in the Federal Register (Volume 54, Number 109), The Arizona Republic, Corpus Christi Caller-Times, and the Valley Morning Star.

Letters of comment on the final draft have been reproduced in this section and are followed by the Service's responses.

SIERRA CLUB



LOWER RIO GRANDE REGIONAL GROUP

June 8, 1989

Refuge Manager
LAWLR
PO BOX 450
Rio Hondo, Tx 78583

Dear Manager,

On behalf of our group, I would like to offer thanks, congratulations, and comments on your 1988 LISTED CATS OF ARIZONA & TEXAS RECOVERY PLAN by US FISH & WILDLIFE SERVICE. The recommendations are a beginning but there are further areas that need to be investigated.

- M-1 1) Language is not strong enough for land acquisition adjacent to LANWLR.
- M-2 2) What about the land north of the refuge? Is this Willacy County land valuable as habitat? Is it in danger?
- M-3 3) There is no mention of the Arroyo Colorado as a wildlife corridor. It seems that this is prime corridor land-water, brush, and a tie in to the Rio Grande. The Arroyo is being farmed to the bank, is being developed for residential use. How far do the cats use the Arroyo? Should cities along the waterway leave brush plots?
- M-4 4) Mexican land- Is it viable to have debt relief in exchange for park/refuge land along the coast or Rio Grande?
- M-5 5) The IBWC destroys prime habitat along the Arroyo, the Rio Grande, and along the Floodways. They need to be stopped. It all defies common sense for one government agency to spend millions to destroy brush and another to spend millions to buy land and reforest land.
- M-6 6) Can dry culverts/crossunders be placed along highways adjacent to the refuge to decrease roadkills.
- M-7 7) More reforestation of refuge land.
- M-8 8) Involving private groups such as Nature Conservancy in land acquisition.

Sincerely,

Mike Mezmar
Mike Mezmar
2045 Ravenwood
Harlingen, Tx 78550

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JUN 8 1989

Laguna Atascosa
National Wildlife Refuge

"When we try to pick out anything by itself, we find it hitched to everything else in the universe." John Muir

recycled paper



INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO

OFFICE OF THE COMMISSIONER
UNITED STATES SECTION



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CENTENNIAL

Mr. Ray Rauch
Refuge Manager
Laguna Atascosa National Wildlife Refuge
P.O. Box 450
Rio Hondo, Texas 78583

Dear Mr. Rauch:

Thank you for the opportunity to review the draft publication, "Listed Cats of Arizona and Texas Recovery Plan." The plan is prepared to help guide the recovery effort of the U.S. Fish and Wildlife Service (Service) for endangered cats in south Texas and parts of southern Arizona. The area of emphasis for the recovery actions outlined in the plan is south Texas, especially the Lower Rio Grande Valley.

One of the major activities of the U.S. Section of the International Boundary and Water Commission in the Valley is operation and maintenance of the joint international Lower Rio Grande Flood Control Project. The Lower Rio Grande Flood Control Project is a flood control system that consists of levees along the Rio Grande in both the United States and Mexico designed to handle flows of 250,000 cubic feet per second (cfs) with a 20,000 cfs design flow through the metropolitan area of Brownsville, Texas and Matamoros, Tamaulipas. The project also consists of interior floodways in each country, with flood flows diverted equally into these floodways.

The main channel of the Rio Grande will handle a significant amount of the flow, but when flood stages approach the design flow then any overbank flows must remain within the levees. The U.S. Section is concerned with the ability to pass the design flows through the flood control system without raising stages due to restrictions of the floodway. To meet our international obligation of providing adequate channel capacity, we annually clear as part of our maintenance program less than 300 acres of brush in a 34-mile long reach of the Rio Grande in the vicinity of Brownsville and Matamoros. Clearing and mowing is also done as part of our maintenance on the interior floodways.

The U.S. Section and the Service, Region 2, have met with regard to clearing issues in the Valley. Over the last several months the U.S. Section has been in the process of collecting new data at historical river channel cross sections and has been surveying new cross sections of the river. A schedule has been established by the two agencies for the completion of an updated backwater study by the U.S. Section. The updated information will be shared with the Service, and plans are to proceed with interagency consultations on the clearing issues based upon the new study. Both the Service and the U.S. Section are proceeding to develop a management plan in the Valley which is mutually acceptable.

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Among the objectives listed in the recovery plan is the determination of parameters such as territory, home range, and corridor habitat size and distribution for these species. Also, habitat type used and needed to support breeding cats needs to be determined and described in detail. The U. S.

N-2 Section is very interested in this objective since it will aid in our determination of areas where we might impact the species with our activities.

The U.S. Section will support, to the extent possible, recommended measures that will lead to the eventual delisting of the Endangered Cats of Arizona and Texas. Accordingly, we feel it is critical that the U.S. Section be included

N-3 in any interagency committees or in any agreements developed regarding these listed cats. We are anxious to meet with the Recovery Team to exchange information and establish management objectives for the development of a viable recovery plan.

Thank you for consideration of our comments. We would like to receive four copies of the final recovery plan when it is available.

Sincerely,



Conrad G. Keyes, Jr.
Principal Engineer

cc: Michael J. Spear, Regional Director,
USFWS, Region 2, Albuquerque
Roy Perez, Field Supervisor, USFWS,
Corpus Christi Ecological Services Field Office
Sam F. Spiller, Field Supervisor, USFWS,
Phoenix Ecological Services Field Office
Nita M. Fuller, Associate Manager,
AZ/NM, USFWS, Region 2, Albuquerque



The Humane Society of the United States
2100 L Street, NW
Washington, DC 20037
(202) 452-1100

July 7, 1989

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Refuge Manager

Laguna Atascosa National Wildlife Refuge
P.O. Box 450
Rio Hondo, TX 78583

Re: Comments on the Draft Recovery Plan for listed
cats of Arizona and Texas

Dear Recovery Plan Coordinator:

We urge that the Recovery Plan for listed cats of Arizona and Texas include a full range of specific recovery actions for margay, jaguarundi, and jaguar, as well as ocelot. We question the statement that "plans for the recovery of these species cannot be developed until their presence is confirmed" (p. 23). In recent years, jaguarundi and jaguar have been killed in the American Southwest. The geographic ranges of these species include this region. Animals can and do occur, at least as dispersed individuals from Mexico.

Recovery planning should include:

1. Protection of adequate habitat to ensure future viable populations. We strongly urge that the Recovery Plan adopt a goal of "no-net-habitat loss" for those landscape-level ecosystems upon which these endangered felids depend. At the same time, estimates of the spacial requirements for viable populations, however preliminary, should be made. Aggressive recovery efforts are needed to conserve and restore adequate habitat.

2. Measures, such as an aggressive public education effort, management for high density prey populations, etc., that improve the likelihood for recolonization of habitat by these endangered species.

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Laguna Atascosa
National Wildlife Refuge

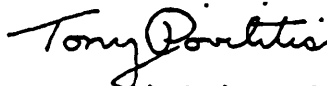
Page Two
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- 0-4 3. Plans for population augmentation and reintroduction, as needed to establish viable populations.
- 0-5 4. A joint U.S.- Mexican program to protect critical habitats that extend into Mexico.

Finally, we strongly support continued land acquisition for the Lower Rio Grande Valley Wildlife Corridor in conjunction with the Santa Ana NWR. The Corridor is now nearly half completed and will provide a vital uninterrupted habitat for all these species.

We appreciate this opportunity to comment.

Sincerely,



Tony Povilitis, Ph.D.
Senior Scientist
Wildlife and Environment

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JUL 10 1989

Laguna Atascosa
National Wildlife Refuge



AMERICAN FARM BUREAU FEDERATION

225 TOLUAY AVENUE • PARK RIDGE • ILLINOIS • 60068 • (312) 399-5700
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July 10, 1989

Refuge Manager
Laguna Atascosa
National Wildlife Refuge
Post Office Box 450
Rio Hondo, Texas 78583

Re: Comments on Draft Recovery Plan for Listed Cats of
Arizona and Texas

Dear Sir:

The American Farm Bureau Federation and the Arizona Farm Bureau Federation are pleased to offer comments on the draft recovery plan for listed cats in Arizona and Texas. As identified in the draft, the species covered by the draft recovery plan are the: ocelot, margay, jaguarundi and jaguar.

All four species are found primarily south of the U.S.-Mexico border. With the exception of the ocelot, relatively few reports of sightings in the United States have been made. Given this geographic distribution, there may be any number of reasons that these animals are no longer found in the northernmost portion of what may be described as their historic range.

P-1 The recovery efforts outlined in the draft plan should first be evaluated with respect to the total known populations of these species, including areas outside of the United States. Since the U.S. population of any of these species is only a small fraction of the overall population and its range, as recognized in the draft recovery plan, any recovery efforts that might now be undertaken should have only a very slight impact on these species. We believe that your decision to defer any specific recovery recommendations until populations dynamics and demographics are studied further, is a wise one.

P-2 As mentioned in the draft recovery plan, little is known about the biology of any of these species. You recognize that much more information must be obtained about these species before any concrete recovery efforts could begin in the United States. Any action that might be taken before you know the biology, habitat or living requirements of these animals might be detrimental to the species itself. Also, since certain recovery actions might have a detrimental effect on human activities, including production agriculture, we would urge that the necessary information be obtained before any recovery action would occur. This would include deferral of preservation or acquisition of possible habitat on non-federal lands.

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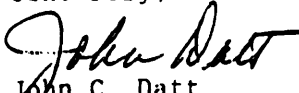
Laguna Atascosa
National Wildlife Refuge

Page 2

- P-3 The draft plan calls for preservation and/or acquisition of suitable habitat for the species, for the purpose of possible reintroduction. Again, we would urge caution until more is known about these animals and before additional critical habitat is designated.
- P-4 Any new habitat requirements should, as much as possible, be located on federal lands. In this regard, the agency should be aware and comply with Executive Order No. 12630 concerning taking of private property especially as the proposed action might impact on agricultural practices.
- P-5 Should non-federal lands need to be acquired, we strongly urge the service to observe the following procedures: First, any private property should only be acquired from willing sellers. Secondly, only so much of the property as is absolutely necessary for critical habitat use should be acquired. This would mean that private landowners should be permitted to retain subsurface mineral rights, water rights and any other aspect of property ownership that is not absolutely necessary for habitat use. Third, only so much property should be used as is necessary for the critical habitat of the species as defined, with emphasis on using federal and/or state lands whenever possible.
- P-6 Given the relatively large geographical range of these species in Central and South America, we think that reintroduction of any of these species in Arizona and Texas should be made only as a last resort. This is especially true where, as here, there have been very few reported sightings in these areas. In any event, reintroduction should not occur unless area residents expressly consent to the reintroduction. Survival of any translocated species will ultimately depend on the support of area residents, so any chances for recovery would be greater where the landowners have knowingly and fully consented to changing agricultural practices and other lifestyle modifications to accommodate these species. Reintroduction should not even be considered until the biology, habitat requirements and feeding habits of the affected animal are fully known and there is a demonstrated need for reintroduction of a species as necessary for the species' survival.

We hope that you will give careful consideration to these comments in the formulation of your final recovery plan.

Sincerely,


John C. Datt
Executive Director
Washington Office

cc: Cecil H. Miller, Jr., President
Arizona Farm Bureau Federation

S. M. True, Jr., President
Texas Farm Bureau

Responses to Comments Received During 30-Day Public Comment Period on Final Draft

- M-1 Protecting suitable habitat adjacent to Laguna Atascosa NWR is extremely important. This has been addressed further in Appendix I.
- M-2 Willacy County does have tracts that are valuable as habitat and some are in danger. Updated maps have been created regarding priority land acquisition. Portions of Willacy County have already been purchased.
- M-3 Brush tracts along the Arroyo Colorado have shown considerable ocelot use. This potential link to the Lower Rio Grande Corridor needs to be protected. It would benefit ocelots to leave brush plots along the Arroyo Colorado.
- M-4 Although the Service has no active program and no authority to do so at this time, a program initiated by private organizations may be one to consider.
- M-5 The Service is very concerned and is currently working with the IBWC on this issue.
- M-6 This has been done in one instance and the Service hopes it will be continued.
- M-7 Reforestation is presently ongoing and will continue to be a very high priority for years to come. The Laguna Atascosa NWR's Master Plan outlines the conversion of 60% of the farm fields back to brush.
- M-8 Funding is always a restraint and involvement by private groups in land acquisition is used where applicable.
- N-1 Brush tracts along waterways, especially along the Rio Grande, are some of the most valuable and sensitive areas used by ocelots and jaguarundi. These tracts provide critical links to corridors used by dispersing cats.
- N-2 Considerable base-line data has been gathered in the past eight years in these areas. Further data need to be obtained, as well as additional funding sources.
- N-3 The Service has full intentions to include the IBWC on inter-agency committees and share any information that may assist in its operations. We appreciate the cooperation being extended toward the interagency MOU to improve our working relationship.

- O-1 A step-down outline is provided for jaguarundi, page 27. The jaguar's status in northern Mexico and especially in the United States is unconfirmed. Recovery recommendations and funding cannot be pursued until status is confirmed.
- O-2 Comment is addressed under steps 131-144. We agree that protection of adequate habitat is the best way to attempt to ensure viable endangered cat populations. Estimates for the special requirements for viable populations of endangered cats are too preliminary at this time.
- O-3 Comment is addressed under steps 142 and #5 on page 53. A great deal of management effort is dedicated to public education and prey populations at Laguna Atascosa, Santa Ana, and Lower Rio Grande NWR's.
- O-4 Comment is addressed on Page 38 and 39, #2.
- O-5 Comment is addressed under steps 113 and 414. A joint U.S.-Mexico program is of high priority and research proposals have been written and await funding toward gathering biological baseline data on status and ecology of various cats in Mexico.
- P-1 The Service is mandated by law to operate under the Endangered Species Act regarding the recovery of cats and their subspecies included in the United States. Cat populations are threatened throughout most of their range with habitat loss having the greatest effect both outside and within the U.S.
- P-2 The Service has dedicated eight years of continuous research through Fiscal Year 89 on the biology and living requirements of ocelot. Recovery efforts will carefully take into consideration detrimental effects on human activities, including agriculture production, land owners and the species themselves.
- P-3 Comment Noted.
- P-4 Comment Noted.
- P-5 Comments addressed under steps 141-143. The Service's intentions are to protect habitat through volunteer easements, revegetation or acquisition when and where available.
- P-6 Translocation or reintroduction are not undertaken by the Service until careful consideration is given to the impacts to area residents, agricultural practices and the cats themselves. We believe there is strong support for ocelot conservation and that further public education is needed for a better understanding of and coexistence with ocelots in Texas.